SPECIAL COLLECTORS' ISSUE!

October 1988

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Radio Control CAR ACTION

THE WORLD'S PREMIER R/C CAR MAGAZINE

Canada $3.75

How to Use LIQUID MASK

SCHUMACHER CAT XLS!

INDY Special

Radical!

THE BUDGET RACER

1/4-SCALE DRAG SPRING NATS

More RC10 TECH TIPS

FORMULA I RC

MOTOR MAINTENANCE MACHINES

10

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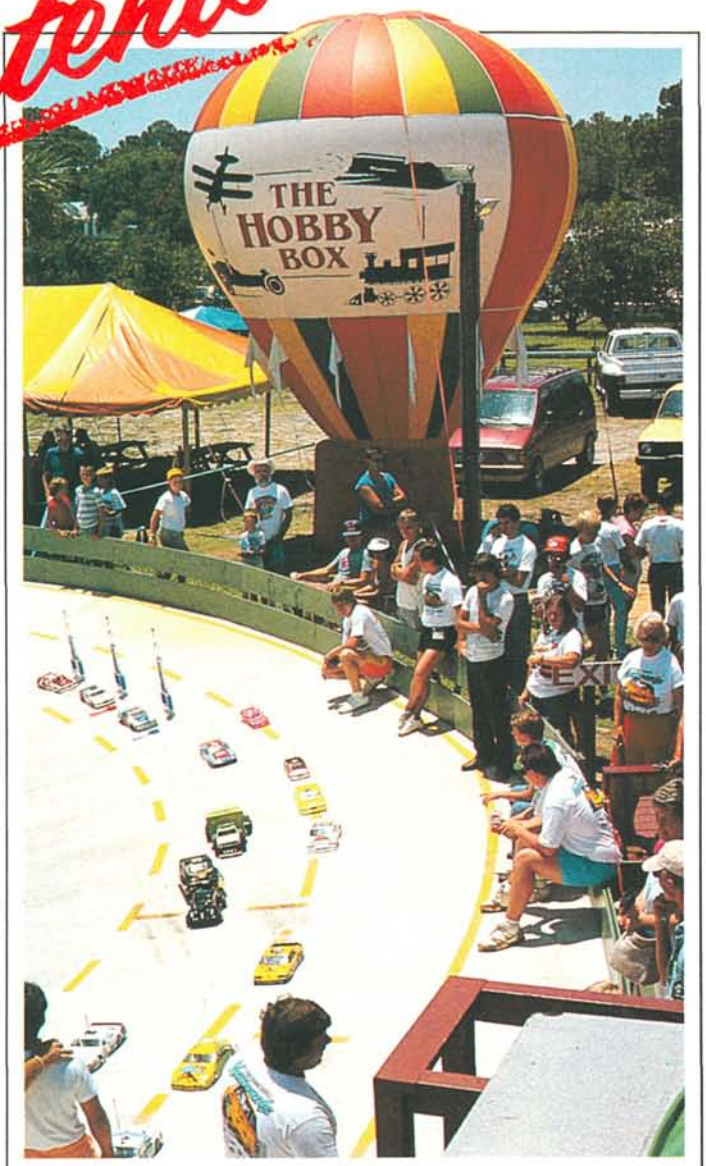

ON THE COVER: At the center of this month's Indy Special cover are three Penske team cars with Rick Mears, winner of this year's Indy 500, in the lead, followed by Danny Sullivan and Al Unser Sr. (Photo by Steve Pond.) If the open-wheel thing is for you, take a look at the bottom right Tamiya 1/10-scale F 1 cars in the photo by Steve Pond. The action at the ATCO Spring Nats (shown in the background photo) was hot and heavy. The Micro Nitro Funny Car is at bottom left and the Camden Tools Rail at top right. (Photos by Eric Goldschrafe.) And let's not forget the beautiful Kathy Bonadurer holding the Schumacher Cat XLS. (Photo by Greg Newman.)

FEATURES

TRACK REPORTS

DEPARTMENTS

Radio Control Car Action (ISSN 0886-1609) is published monthly by **Air Age, Inc.**, 251 Danbury Rd., Wilton, CT 06897. Second Class postage paid at Wilton, Connecticut, and at additional mailing offices. Subscription rates are 1 year (12 issues) $25 (foreign $33); 2 years (24 issues) $47 (foreign $63). **Postmaster:** Send Form 3579 to **Radio Control Car Action**, P.O. Box 427, Mount Morris, IL 61054.

EDITORIAL

by CHRIS CHIANELLI

WHY AM I standing in front of the Air Age Publishing building with a copy of *RCCA?* It's to let you know that if you'd like your picture in *RCCA*, here's what you do: Send us a black-and-white photo of yourself holding any copy of *RCCA* and standing in front of a landmark, or any other point of interest. This may be anything from your local firehouse (built in 1884 or 1984) to the Great Wall (if you happen to be vacationing in China). We get letters from places as far apart as New Zealand and Norway, so the response may be interesting. Don't forget to include your name and address.

This month, we have a look at open-wheel road racers—namely, Indy and Formula 1 cars. Steve Pond once again brings us more superlative photos in his Indy report. (Lots of paint-scheme ideas, here.) "King Ura" and I take a look at the Tamiya F 1 cars, and Tai Sugahara reviews the Advance Engineering Street Machine and does it up with an Indy body. We had planned to bring you the Advance RC 10 Indy car conversion, but there were some production delays, so we'll cover that in an upcoming issue.

From the Land of the Funny Car comes "Von Erich" Goldschrafe with an ATCO Raceway report on all scales of Funnys, Pro Stockers and Rails and how they did at the showdown in New Jersey. Joe Bruni shows you a trick way of masking Lexan bodies with Parma's Liquid Mask, and Jeff and Cam Palmer's RC 10 Tech, Part II, gives hot performance tips that don't cost a bundle. And, of course, there's *lots* more!

ABUSEMASTER GENERAL'S WARNING: Running R/C cars may be deleterious to your grade point average! ■

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Letters

Lunch Box Glutton

I'm a 13-year-old R/C enthusiast (maniac). I currently own a Tamiya Lunch Box, and I'm modifying it for sled pulls and tugs of war. I have some questions to ask:

1. Do they sell a heavy-duty steering kit for the Lunch Box?
2. Does the Marx Hectaperm GT 500 motor fit on the Lunch Box? If not, is there anything with more torque than the Option House SPA 480 WT motor?
3. Do traction bars fit the Lunch Box? Does it need them? What do they do? Where can I get a pair?
4. The only thing I dislike about the Lunch Box is the way the front wheels curve in. Is there any way I could fix that? In your awesome article on the Midnight Pumpkin (not as awesome as the Lunch Box's) I noticed these pieces on the top of the front shocks. What are they? Where can I get some?
5. Do they sell a piece that keeps the gearbox from moving when the box starts off?

Long live the Wasteland Lunch Box!

Jim Mastroddi
Norwood, PA

Dear Jim,

1. No.
2. No and yes.
3. Yes; maybe; nothing for trucks; and you can't—you have to make them.
4. Lower the front suspension; model fuel tubing; and the hobby shop.
5. No.

SP

They Stink

I am from the the Netherlands and I am so glad that your great magazine is now available in the shops here. I showed the magazine to my Dutch friends, and they're impressed, because the R/C magazines here stink!!

I need your help because I'm interested in buying the Kyosho Burns, the Kyosho Optima Mid or the Tamiya Avante, but I can't decide which one to buy.

I'd appreciate any information on the 1/8-scale Burns 4WD and especially a comparison between Kyosho Optima Mid 4WD and the Tamiya Avante 4WD.

Johnny Chang
Netherlands

Johnny, the Avante is already starting to make a name for itself, and a very famous driver (who will remain nameless) told me he was very *impressed with the cars handling. However, the Avante is still new, and the Optima Mid has had the time to prove it's a very capable car. I can see that an Avante/Optima Mid shootout is unavoidable, and we should throw in the Cat and the C-4 for good measure. The Optima Mid does have a fairly low*

parts count for a 4WD off-roader, and simplicity usually leads to reliability. However, since the Cat XLS and the C-4 are even newer, the jury remains out. But there is one question you can answer for me: How do I answer your question about the 1/8-scale, .21-powered, fire-breathing methanol monster in terms of comparison with a 1/10-scale electric. Maybe you're just the guy to tell me how to do that. Please write again with your response, Johnny. CC

Manx Malaise

Your magazine is the best! However, I disagree with your review of the Mugen Manx. I bought one for my 10-year-old brother, and when my dad and I put it together and ran it, it instantly broke. The gears fell apart inside the gearbox. I spent the next three weeks trimming, replacing and oiling gears, only to find that I'd be better off buying a Hornet gearbox and installing it on the Manx.

I just want you to know that all Manx owners aren't as happy with the car as you were.

Kirk William
Encino, CA

Kirk, during a discussion with T.J. Lyn, who reviewed the Manx for us, we learned that your concerns are, in fact, valid. After a period of time, it appears that, due to the softer plastic/nylon material used in the manufacturing of the Manx gearbox, flexing of the housing can cause internal gear movement and stripping. T. J. recommends replacing the gearbox housing with the Grasshopper/Hornet assembly—an inexpensive solution to the problem.

We want to hear about any problems with your cars, so we can help. That's what we're here for! CC

New to R/Cing

I'm a 13-year-old girl and new to the R/C sport/hobby. Which would be best for me: the Tamiya Falcon or Hornet? I think your magazine is great! Could you please write an article on the Falcon—or if you already have, please tell me where I can find it? I loved your "Torture Test" article on the Hornet. Help!

Olivia Arthur
Irvine, CA

Olivia, I think it's great that women are becoming interested in R/C car racing. Women R/Cers bring maturity, patience and dexterity to the sport of R/C racing; it's a pleasure to race with them, and I hope the number of female R/Cers continues to climb. Anyway, I recommend the Falcon because of its independent rear suspension. Look for our article in the Winter '87 issue. Good luck—see you in the winners' circle! CC

Letters

We Did! We Did!

I'm upset with your magazine! You were supposed to have a two-part article on the Kyosho Optima. What happened to the second part on how to lighten the car? Please finish what you started!

Scott Frasieur
Coos Bay, OR

Scott, it appears that you've missed an issue. Part two of Project Optima, entitled, "Lose every last ounce ROAR will allow," was in the Feb. '88 issue of RCCA. *Part 1, "The Kyosho Option House Conversion," was in the Dec. '87 issue.* CC

The Real World

I own an Ultima and I'd like to say something to RC 10 owners. I can understand why some people would be ticked off because the Ultima swept IFMAR. Sure, the RC 10 is a good car, but how long did you actually think the RC 10 would rule the 2WD off-road buggies? I don't expect the Ultima to be king of 2WD buggies forever. Somewhere, someone will build a car better than the Ultima; it's just got to happen. So RC 10 owners should just settle down, because sooner or later *there will be* a buggy to beat the Ultima.

Dan Gillis
Portage, IN

Dan, you're right! Someone is always going to be there trying to claim the title of "World Champ." Yes, the Ultima did win the World Championship, and it's a fantastic car; but that was only one race. Only time will tell if the RC 10 will be reinstated as it meets the Ultima in future races. Still, you are missing a simple point—nothing replaces practice! I get so many letters (we love it—don't get me wrong) saying, "What can I do to make my car so fast that I can beat my friend's in a race?" The best thing you can do is hone your driving skills; no hot motor or expensive speed controller is a substitute for that! So no more whining about which car is the best; just be the best driver you can be! CC

Rocket Frog

I am very interested in your article, "The Final Countdown" (July '88). Is there any way I could convert my Frog into a rocket-powered machine? If so, how? Keep up the good work!

Jason Redington
Rockford, Illinois

Jason, I definitely think you should bag the afterburner reptile idea—it would be aerodynamically unsound and dangerous. The Plazama that was used in the article is a very streamlined road car, but if anything went wrong, it became airborne. Your aerodynamically dirty Rocket Frog would do one heck of a leap when you lit it up. I admire your enthusiasm, but the Rocket Frog should live only *in our R/C-crazed minds.* CC

Tony, It Isn't, It Isn't!

Congratulations on a terrific magazine; it's the only magazine I ever buy now.

I recently purchased a Kyosho Optima. When I went to order it, the dealer at the hobby shop told me that Kyosho was soon going to take the Optima series (except the Optima Mid) off the shelves. He said Optima, T-Optima, Javelin and Salute were going. He also said that if I *did* order the Optima, I wouldn't be able to get parts for it. *Is this true?* Please say it isn't.

Thanks, and keep up the excellent work.

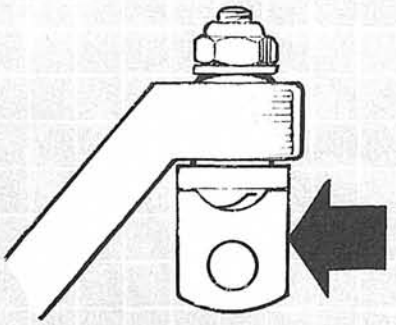
Tony Ponzo
Cornwall, Ontario, Canada

Tony, the Optima in all its forms will be available for some time, along with the Mid. There still seems to be a great demand for the original, less expensive Optima. Kyosho can see no reason to discontinue a car that's in demand, so if demand lasts, so do the Optima, Turbo Optima, Salute... CC

We welcome your comments and suggestions. Letters should be addressed to "Letters," *Radio Control Car Action*, 251 Danbury Rd., Wilton, CT 06897. Letters may be edited for clarity and brevity. We regret that, due to the tremendous number of letters we receive, we cannot respond to every one.

Pit Tips

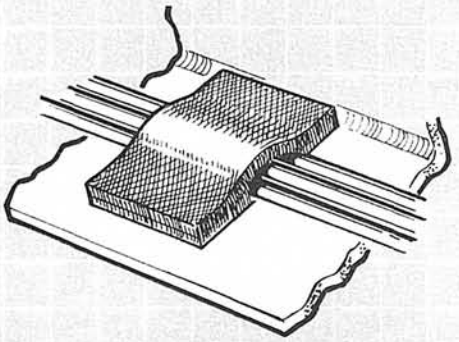
by JIM NEWMAN



GRASSHOPPER SHOCK ADAPTOR

If you want to use a wider assortment of shocks on the front of your car, bolt on these spring mounts (Grasshopper Part No. G-6), using 3mm locknuts and 3x8mm screws.

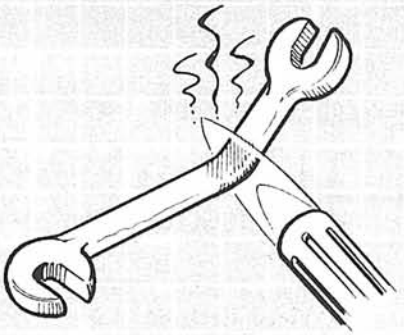
Tim Crabb, Council Bluffs, IA



NEAT WIRING

Stick a piece of Velcro to a suitable place on the chassis, then neatly arrange the wiring across it. Trap the wires by pressing the matching piece over them. Wiring that is secured is less likely to fracture at the connections.

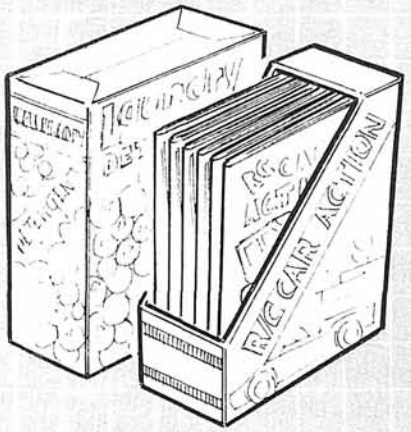
Warren Moon, Orillia, Ont., Canada



RC 10 AXLE-NUT WRENCH

To simplify the job of removing RC 10 front-axle nuts, this car owner heated a regular 7/32 ignition wrench, then bent it as shown.

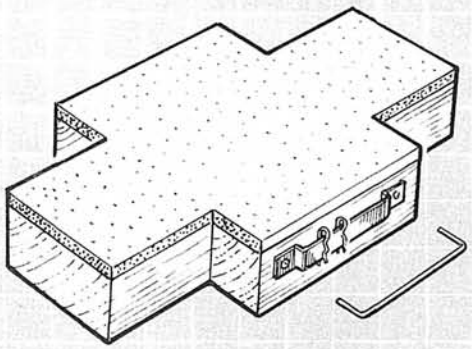
Russ Ritchie, Brandywine, MD



MAGAZINE FILES

Here's an inexpensive way to preserve your valuable copies of *R/C Car Action:* Cut laundry detergent boxes as shown and cover them with shelf paper or wallpaper. Write the magazine title and year on the front panel.

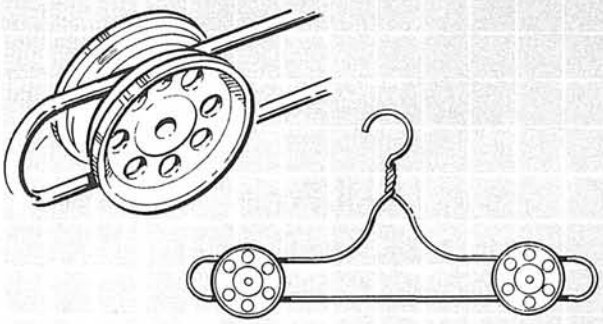
James Hedjazi, San Bernardino, CA



PARKING BLOCK

To keep flat spots from forming on his tires, and to eliminate the possibility of a run-away car if the radio is left on, this owner cut a block from a 2x8 and glued ¼-inch foam rubber on top. Be sure the finished block keeps the car wheels clear of the ground. The wire or metal strip holds body clips.

Russ Vermillion, Alpharetta, CA



WHEEL-PAINTING JIG

To hold wheels for painting, simply squeeze together a wire coat hanger, then slip the wheels in as shown. Spray, and hang to dry.

Mike Wheelock, Pocatello, ID

Radio Control Car Action will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send rough sketch to Jim Newman, c/o **Radio Control Car Action,** 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO, AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.

What time do you think it is?

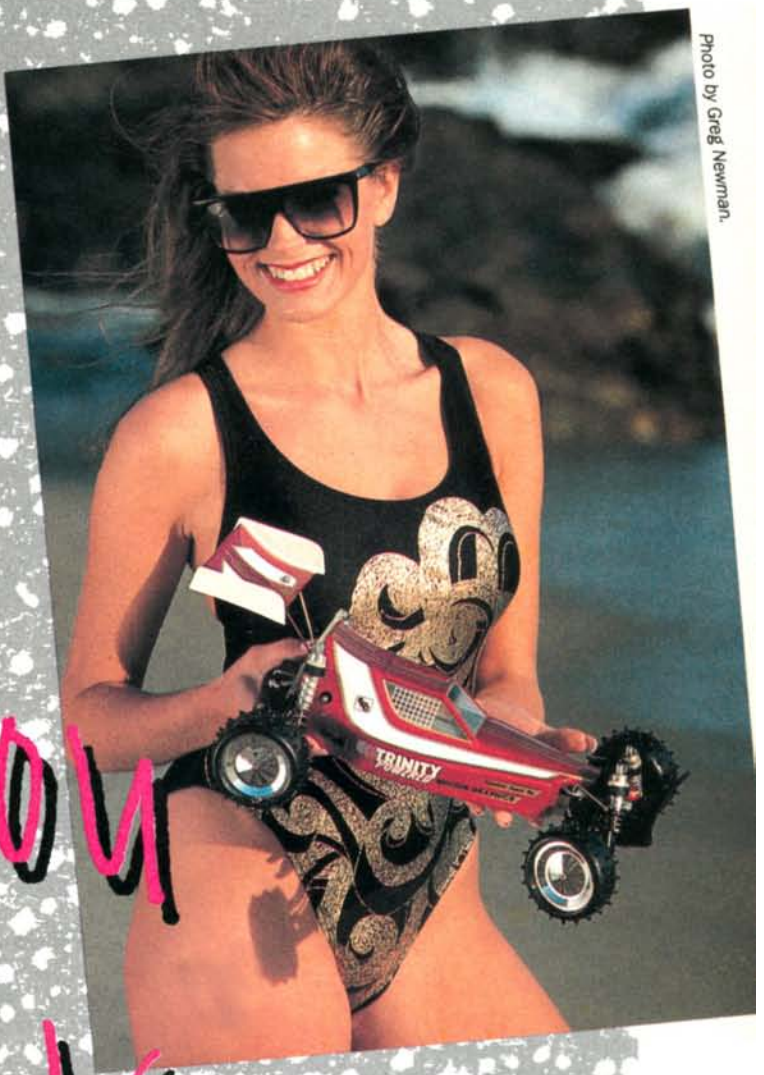
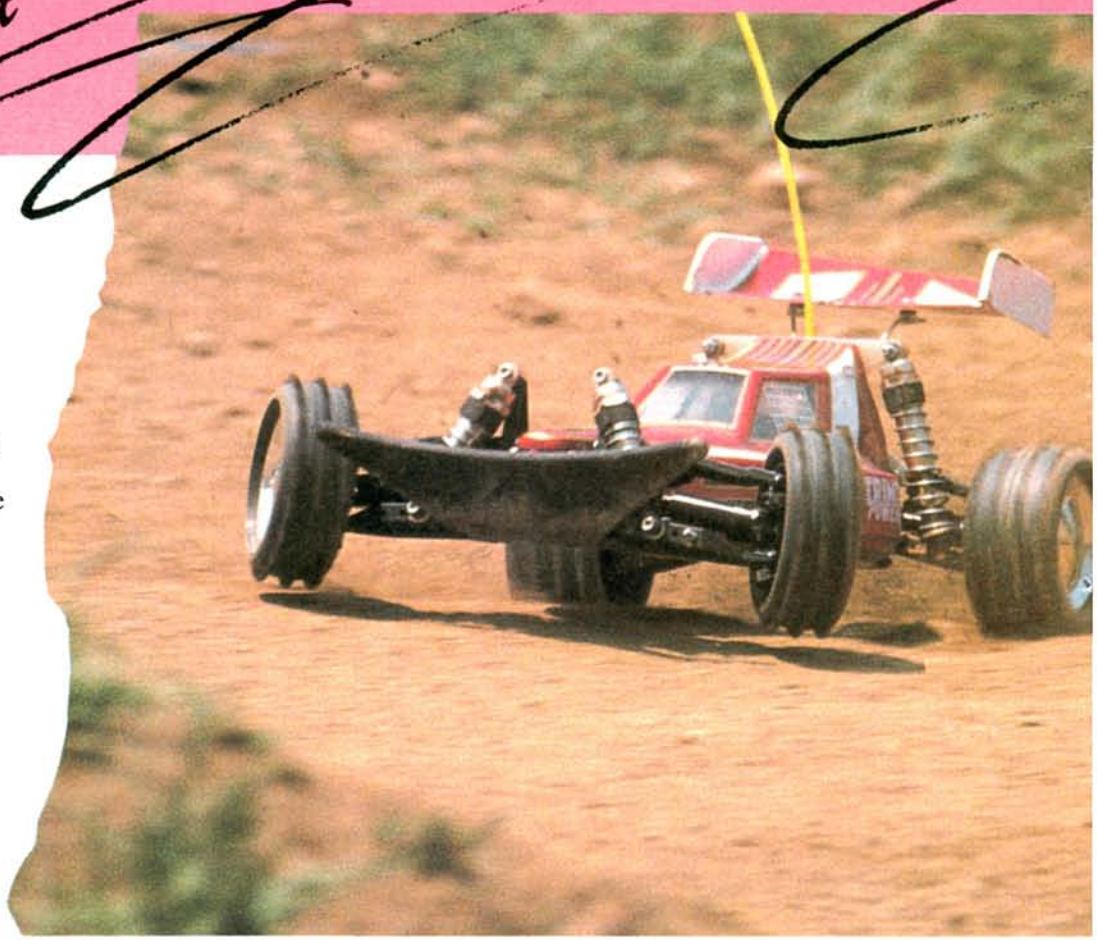


Photo by Greg Newman.



BY NOW, THE news of the 1987 IFMAR World Championships in England is old. Anyone who follows R/C racing knows who won and which car he was driving. One of the victors was Masami Hirosaka of Japan, who won 4WD Class with his Schumacher* Cat XL. One element makes Hirosaka's conquest of the Worlds unique. In the World Championships and other global high-ticket events, most, if not all, of the previous winners in both the 2WD and 4WD Classes have been modified extensively to boost performance. While Hirosaka's Cat was also modified, his subtle changes were all made with optional *factory* parts. The latest kit version of the British-made Schumacher Cat (dubbed the XLS) now includes all the optional parts used on the championship car.

SCHUMACHER

CAT

The Need for Speed

by STEVE POND

The XLS features all the go-fast goodies that should be found on a race car of this capacity, including belt-driven front and rear ball differentials, fiberglass plate chassis, unique universal-joint drive shafts with one-way bearings on the front pair, upper and lower front and rear suspension of molded nylon, precision sealed bearings, oil-filled coil-over shocks and the standard Lexan body. The body for the Cat also includes a chassis pan with an integrated belt guard to protect the belt as it passes under the lower chassis plate on its way back to the rear differential.

These features may sound familiar, and they should, as they can also be found on a number of other competitive cars. However, the design of the Schumacher Cat makes maximum use of these attributes, and this ensures a top-notch performance with each run.

Additions to the XL kit that make it comparable to the XLS include a new, wider, front bumper for additional front-end protection, a front ball differential to replace a central one-way bearing diff, one-way front drive shafts, wider front

SCHUMACHER

CAT

Type ..... 4WD Off-Road racer
Scale 1/10
DIMENSIONS:
Overall Length ..... 14⅝ inches
Width ..... 9⅝ inches
Height ..... 5 inches w/o wing
Wheelbase ..... 10¾ inches
Front Track ..... 8¼ inches
Rear Track ..... 7¾ inches

WEIGHT:
Gross (w/rec. bat.) ..... 3 pounds, 8 ounces
Balance 44/56

BODY:
Type ..... Single seater w/lower chassis pan
Material ..... Lexan

CHASSIS:
Type ..... Plate
Material ..... Fiberglass

DRIVE TRAIN:
Type (prim./sec.) ..... Belt/belt
Differentials ..... Ball (front & rear)

SUSPENSION:
Front: Type ..... Double wishbone
Dampening ..... Oil-filled coil-over shocks
Rear: Type ..... Double wishbone
Dampening ..... Oil-filled coil-over shocks

WHEELS:
Front: Type ..... One-piece plastic
Dimensions ..... 2x⅞ inches
Rear: Type ..... One-piece plastic
Dimensions ..... 2x1¼ inches

TIRES:
Front ..... Spike
Rear ..... Spike

ELECTRICAL:
Motor ..... Not included
Battery required ..... 6- or 7-cell
Speed Controller ..... Not included

OPTIONS AS TESTED:

Novak NESC-1X electronic speed controller, Parma 6-cell matched Sanyo pack, Trinity No. 2004 4WD modified motor, Robinson Racing 48-pitch gears, CRP shock pressure gaskets, CRP 40wt shock oil, Kimbrough servo saver and Futaba Magnum radio W/FP-S135S servo.

COMMENTS:

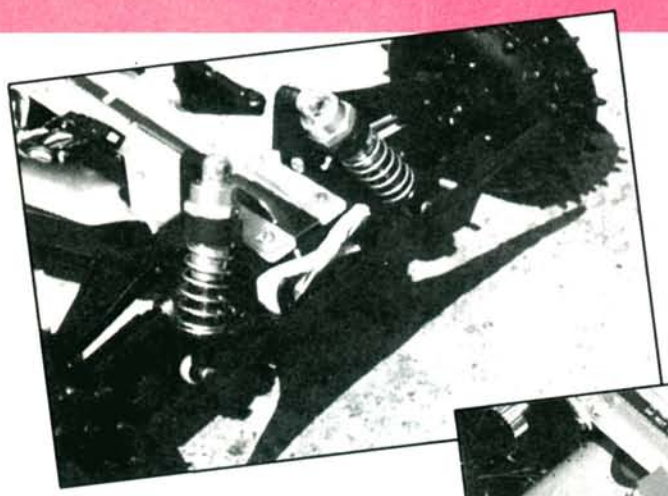
Despite its ability to keep up with or surpass the competition, there's still room for improvement. The dust-seal bearings cause an excessive amount of drag; they should be replaced with a standard precision bearing with a metal seal. The differential could also be improved with a system that would allow you to direct the power more effectively. Construction is rather difficult and requires some previous racing/building experience.

and rear track, extended wheelbase, increased front and rear caster angle, and precision bearings with a dust seal that keeps out virtually all dirt.

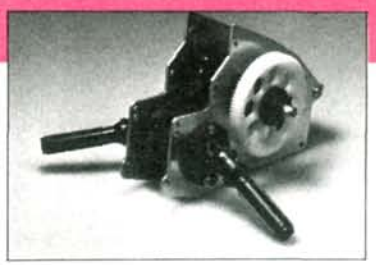
Assembling the Schumacher Cat isn't easy. In its completed state, the Cat may not look complicated, but it has a relatively high parts count, and the possibilities for confusion are compounded by the not-so-specific instructions. A car of this caliber will always demand attention to detail, but you may have to do a little reading between the lines to ensure a smooth assembly.

ASSEMBLY: This begins with the rear differential and layshaft. The layshaft transmits the power from the spur gear to the rear differential via two short belts. The rear differential comprises three separate belt pulleys. The center pulley has holes molded in for the diff balls, while the outer pulleys have flanges molded on the inside for the mounting of the diff rings. The diff rings must be epoxied to the inside of the outer pulleys to ensure consistent operation. It's vital to take a little extra time here, as this step will determine how well the differential will operate.

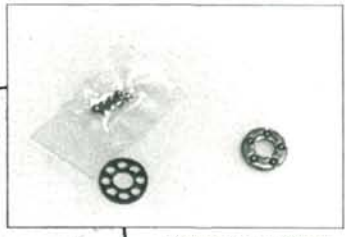
After applying a thin coat of epoxy to each pulley, I seated the diff rings and



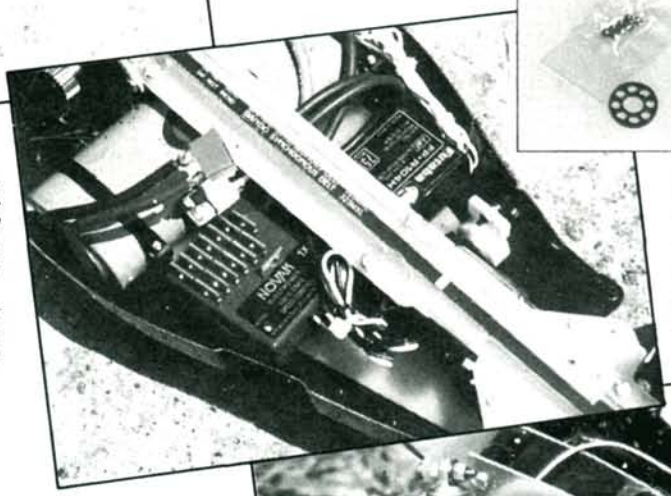
Above: *To protect the Cat from damage during a collision, a rubber band stretched across the front end will allow the suspension components to pivot back when hit hard, thus preventing breakage.*
Right: *Lexan chassis pan keeps dirt away from internal components while clear belt cover keeps debris from entering differential.*

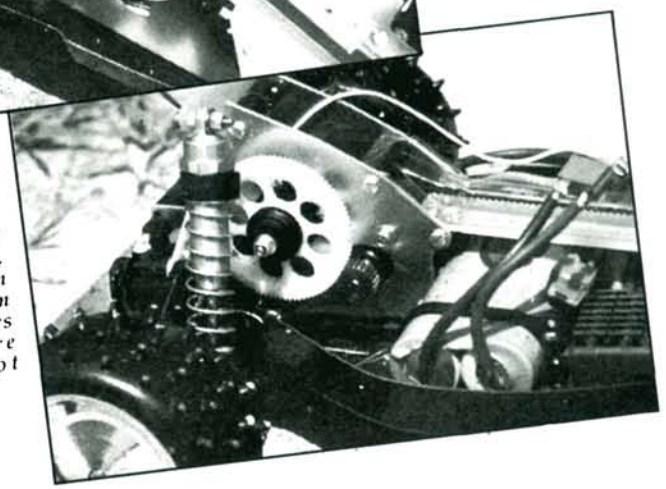


The differential may not look complex, but assembly is tedious and time-consuming.

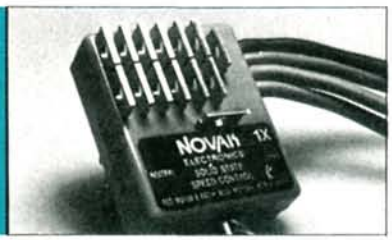


When the original thrust bearing on the left is replaced with the Parma bearing on the right, differential assembly becomes a breeze.





Robinson Racing 90-tooth, 48-pitch spur gear replaced the original spur gear. These gears run more smoothly than the original gears because they're machined, not molded.



Although the Novak NESC-1X is larger than most competitive speed controls, it provides excellent low-end punch and top speed.

The new front universal drive shafts include one-way bearings for superior handling.

A view of the unassembled diff shows the three separate pulleys. Diff rings are epoxied to the outer pulleys and the inner pulley houses diff balls.

then assembled the entire differential. By assembling the differential before the epoxy has dried, an even pressure is applied to the diff rings to ensure that they're resting flat against the pulleys. One problem in the diff assembly is the installation of the thrust bearings on the bolt that passes through the diff for adjusting the amount of slip. The included thrust bearings must be assembled, and they consist of a ball cage and eight tiny balls. The balls don't snap into the cage, and this allows them to fall out at any time. The lubricant will help to hold them in place, but they just don't seem practical for maintenance.

Parma* manufactures a thrust bearing (No. 1420-F) that's the same size as the one for the Cat. The Parma thrust bearing is pre-assembled in a metal race that won't allow the balls to fall out. Although the Parma bearing uses five balls instead of the eight used in the stock bearing, there's no compromise in performance or smoothness of operation. I highly recommend that you pick up a pair (one is also needed for the front diff) when you pick up your Cat. The assembled diff is attached to the right-side aluminum housing plate. The diff fits into an eccentric belt tensioner that allows adjustment of the two short belts driving the rear differential.

(Continued on page 150)

OVAL NATIONALS

by RICH HEMSTREET

LAKE WHIPPOORWILL INTERNATIONAL SPEEDWAY was recently the scene of the 1988 Paved Oval Nationals. Cars in both 1/10 scale and 1/12 scale raced around the high banks of this superspeedway, and at the end of the weekend, four new National Champions were crowned.

In both scales, there were Stock and Modified Classes, and all cars used NASCAR-type stock-car bodies. With cars averaging over 40mph on this track, aerodynamics played a major role, so clear wings were not only permitted but were also necessary.

The Hobby Box (a chain of hobby shops) sponsored these first Oval Nationals and Bob Hosch organized and promoted the race. As is usual at Lake Whippoorwill, everything went smoothly, several drivers saying this was the most well-organized National they had ever attended.

After two days of qualifying, Chris Doseck was on the pole in the 1/10-scale Modifed A-Main. Doseck drove his BoLINK* Eliminator 10 at an average speed of 41.479mph for 37 laps. Jim Fuller, driving a Composite Craft* Predator, qualified second fastest, also with 37 laps. In the 1/12-scale Modified Class, swapping spots, Fuller drove an Associated* 12L 47 laps in five minutes for an average speed of 41.880mph, and Doseck also ran 47 laps, with his BoLINK Eliminator 12.

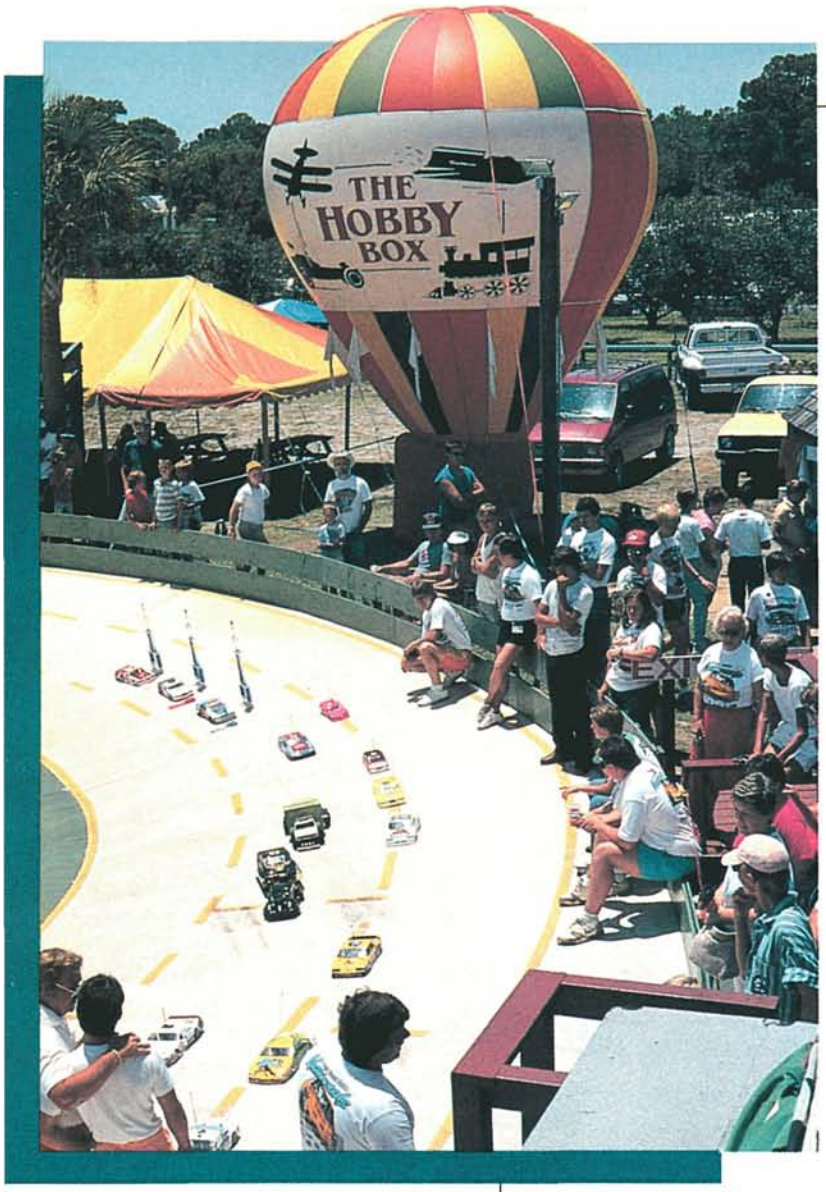
Photos by Rich Hemstreet.

Steve Rule's BoLINK Eliminator 10 covered 33 laps in four minutes to capture the 1/10-scale Stock pole position with a 36.995mph average. Ricky Jordan, also driving an Eliminator 10, ran 33 laps, so nailing the second-fastest qualifying position. Driving a Parma* car to a 43-lap total, while averaging over 38mph, Jeff Irish earned the 1/12-scale Stock pole position on his final qualifying run. Parma then made a front-row sweep when Charles Soltau matched Irish's 43 laps.

Before the Mains, the racers and spectators were treated to a Lake Whippoorwill extravaganza. The McAllister* Concours was followed by a parade of cars, a skydiver and a pair of Ringling Brothers clowns. Spectators were allowed onto the track for a closer look, and when the track was clear, Miss Whippoorwill (Kim Rule) and the clowns released red, white, and blue balloons from the infield. Quite a sight!

When the Lower Mains were over, it was time to find out who would become the 1988 Oval Champions. Jeff Irish took an early lead in the 1/12-scale Stock Main. Irish cranked off some early laps of over 39mph, and James Prince took the lead for a short period, but eventually lost it to Michael Blackmon. When Blackmon crashed, Irish regained the lead, soon stretching it to a full lap and winning the National Championship. Jeff Irish has been racing for only six months, and he already has his first national title. Blackmon recovered to catch second place, and Tom Alff finished third.

STOCKERS ARE HERE TO STAY!



Lake Whippoorwill, which is noted for having the fastest speeds in R/C racing, also has the sharpest-looking machines on display during the Parade of Cars before the Concours contest.

The racing action at Lake Whippoorwill Speedway is hair-raising, as the cars dive into the corners at over 40mph.

At the start of the 1/12-scale Modified Main, Jim Fuller quickly jumped into the lead by running laps at over 42mph. However, by running lap speeds of over 44mph, Steve Swindle took over the top spot. Swindle was still stretching his lead when he nailed a dead car on the track, and Bill Sell then took the number-one spot. By the end of the five-minute Main, Fuller had worked his way around Sell to win the race and the national title. Sell finished second, with John Robinson third.

In the 1/10-scale Stock A-Main, Steve Rule got off to a clean start and then never let up, while Ricky Jordan stayed right on Rule's rear bumper for the first two-and-a-half minutes. Even though there weren't any lead changes, the race was close, and the top three drivers finished on the same lap. Peter Colonico came from third on the starting grid to finish second, and Jordan slipped to third position.

After gluing his eye shut while balancing tires for the A-Mains, Chris Doseck struggled all day Sunday, eventually going to the hospital to have his eye peeled open. At the start of the 1/10-scale Modified A-Main, Doseck jumped into the lead, but was quickly passed by Art Carbonell. The former World Champion was turning 6.35-second laps, but his batteries dumped. Howie Ursaner took the lead, but his batteries dumped, too, so Dennis Vindedahl took over the top spot. Vindedahl had only qualified tenth-fastest, but he thought he had a good shot at the title. He was right! He held on to become the 1/10-scale Modified Paved Oval National Champion; Kevin Perry held on for second; and James Hoffman finished third.

With four new Oval National Champions, it looks as though oval-track racing is here to stay. Congratulations to the new champs: Jeff Irish, Jim Fuller, Steve Rule and Dennis Vindedahl.

**Here are the addresses of the companies mentioned in this article:*
BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.
Composite Craft, 2400 Sand Lake Rd., Orlando, FL 32809.
Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626.
Parma International, Inc., 13927 Progress Pkwy., North Royalton, OH 44133.
McAllister Racing, 4545 Industrial St., Unit 5H, Simi Valley, CA 93063. ■

OVAL CHAMPIONSHIPS—MAY 1988

1/10-Scale Modified Class

Finishing Position	Lap	Elapsed Time	Car Number	Driver	Chassis	Motor	Tires	Body	Speed Control
1	36	4:06.6	10	Dennis Vindedahl	TRC	Twister	TRC	BoLINK	Tekin
2	35	4:00.8	7	Kevin Perry	VicFor	Peak Perf.	TRC	McAllister	Tekin
3	35	4:01.4	8	James Hoffmann	BoLINK	Peak Perf.	BoLINK	BoLINK	Novak
4	35	4:01.8	1	Chris Doseck	BoLINK	CAM	BoLINK	BoLINK	Novak
5	35	4:05.3	9	Howie Ursaner	TRC	CAM	TRC	BoLINK	Tekin
6	35	4:07.0	2	Jim Fuller	Comp. Craft	Reedy	TRC	BoLINK	Novak
7	35	4:09.1	3	Art Carbonell	VicFor	CAM	TRC	BoLINK	Tekin
8	34	4:00.8	4	David Timmerman	BoLINK	CAM	BoLINK	BoLINK	Tekin
9	6	0:52.0	6	Mike Klendworth	VicFor	CAM	TRC	BoLINK	Tekin
10	0	DNR	5	John Robinson	Comp. Craft	Trinity	TRC	McAllister	Novak

1/10-Scale Stock Class

Finishing Position	Lap	Elapsed Time	Car Number	Driver	Chassis	Tires	Body	Speed Control
1	33	4:02.7	1	Steve Rule	BoLINK	BoLINK	BoLINK	Novak
2	33	4:06.2	3	Peter Colonico	TRC	TRC/BoLINK	BoLINK	Tekin
3	33	4:06.9	2	Ricky Jordan	BoLINK	BoLINK	BoLINK	Novak
4	32	4:03.7	7	Tuffy Carrigg	BoLINK	TRC	BoLINK	Novak
5	32	4:06.0	6	Bill Edwards	PRC	BoLINK	BoLINK	Tekin
6	31	4:01.1	4	Jimmy Gest	Comp. Craft	BoLINK	BoLINK	Novak
7	31	4:02.6	5	Kevin Lanier	BoLINK	BoLINK	BoLINK	Novak
8	31	4:04.8	8	Greg Simmons	BoLINK	TRC	BoLINK	Tekin
9	30	4:00.8	10	Toni Hartley	Comp. Craft	BoLINK	BoLINK	Novak
10	29	4:02.0	9	Charles Walker	VicFor	TRC	BoLINK	Victor

1/12-Scale Stock Class

Finishing Position	Lap	Elapsed Time	Car Number	Driver	Chassis	Tires	Body	Speed Control
1	42	5:01.9	1	Jeff Irish	Parma	KRP	McAllister	Novak
2	41	5:04.0	7	Michael Blackmon	N/A	TRC	BoLINK	Tekin
3	41	5:04.9	4	Tom Alff	Associated	TRC	McAllister	Novak
4	40	5:00.0	6	James Prince	TRC	TRC	McAllister	Tekin
5	39	5:00.1	2	Charles Soltau	Parma	TRC	BoLINK	Novak
6	39	5:00.4	8	Charles Walker	Associated	BoLINK	BoLINK	Novak
7	39	5:00.7	5	Hoyte Stacey	Associated	TRC	McAllister	Novak
8	39	5:01.4	9	Gerald Wynn	Associated	TRC	BoLINK	Tekin
9	16	2:01.0	3	Steve Miniea	Associated	TRC	McAllister	Novak

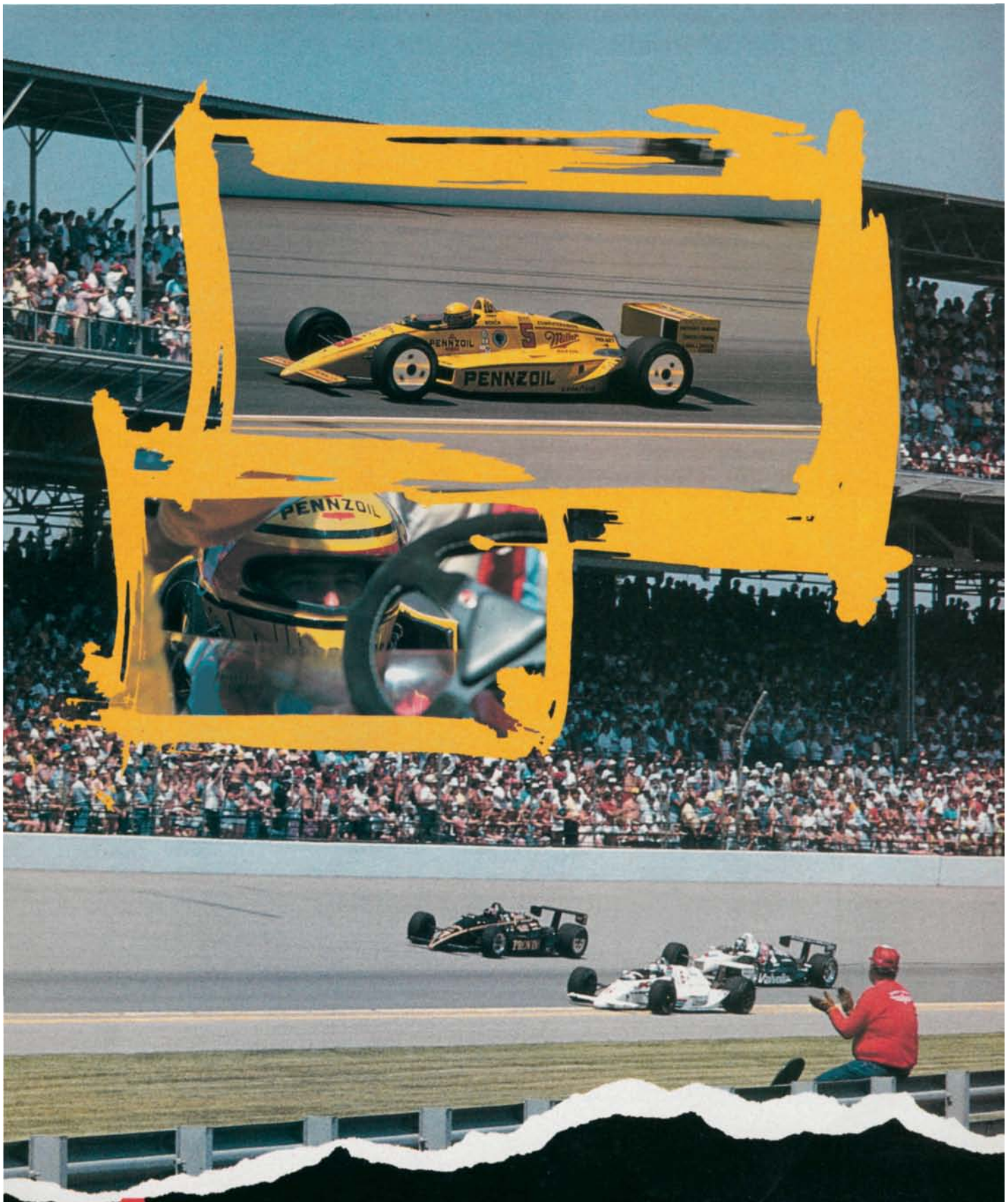
1/12-Scale Modified Class

Finishing Position	Lap	Elapsed Time	Car Number	Driver	Chassis	Motor	Tires	Body	Speed Control
1	47	5:06.9	1	Jim Fuller	Associated	Reedy	TRC	BoLINK	Novak
2	46	5:06.2	3	Bill Sell	Associated	Premier Design	BoLINK	BoLINK	Novak
3	46	5:07.5	4	John Robinson	Associated	Trinity	TRC	MRP	Tekin
4	43	4:58.0	9	Ernie Bucci	Parma	Parma	Parma	Parma	Novak
5	42	4:37.4	10	Steve Swindle	BoLINK	Reedy	BoLINK	BoLINK	Novak
6	35	3:49.7	5	Rick Pruitt	TRC	Peak Perf.	TRC	McAllister	Airtronics
7	7	0:58.1	7	James Hoffmann	BoLINK	Peak Perf.	BoLINK	BoLINK	Novak
8	6	0:38.3	8	Bob Novak	Associated	Reedy	BoLINK	McAllister	Novak
9	5	0:35.3	6	Bob Sumner	TRC	CAM	TRC	McAllister	Novak
10	1	0:07.0	2	Chris Doseck	BoLINK	CAM	BoLINK	BoLINK	Novak

GENTLEMEN, START YOUR ENGINES...

by STEVE POND

Photos by Steve Pond.



AT 5 A.M., the detonation of a bomb by the military signals the opening of the gates through which nearly half a million spectators will pass. At 8 a.m., 33 of the world's fastest closed-course racing machines are pushed from their garages in the famous Gasoline Alley to their respective pit areas. The pomp and pageantry that follows includes the playing of "On the Banks of the Wabash," the National Anthem, and "Taps" (in honor of the war veterans on Memorial Day), and at the conclusion of "Back Home Again in Indiana," the oh, so

Indianapolis 500

Dick Simon, challenging from the outside, went on to finish 9th while Moran (in the foreground) went out with engine failure on the 158th lap.

familiar "Gentlemen, start your engines" is belted out and is quickly followed by the roar of the turbo-charged methanol-burning engines coming to life. With the pace car taking the lead, all the racers make a parade lap around the massive 2.5-mile oval. The butterflies of anticipation and anxiety begin fluttering in the stomachs of the drivers, as well as those of the spectators, as the cars take a final pace lap. When the pace car rounds the fourth turn and heads for the pit road entrance, the drivers chase the green flag for the start of the most prestigious motor-sport event the automotive racing world has to offer—the Indy 500.

The Indianapolis Motor Speedway dates back to 1911 when the first 500 race was run with cars by the names of Marmon, Lozier, Mercedes, Fiat and Simplex. Ray Harroun was the driver who took the honors as the first to win the 500 in his Marmon, powered by a six-cylinder, 447-cubic-inch engine. It took Harroun 6 hours, 42 minutes and eight seconds to complete the 500 miles, with an average speed of just under 75mph. The vehicles were somewhat crude, but at this time when the automobile

Above: *Mario Andretti, driving his new Amoco/K-Mart Lola, leads Al Unser Jr. and Arie Luyendyk through the first turn. Andretti dropped out of the race on the 118th lap with ignition troubles.*
Right: *Roberto Guerrero in the bright red STP Lola was taken out of the race on the first lap by Scott Brayton. Michael Andretti finished 4th*

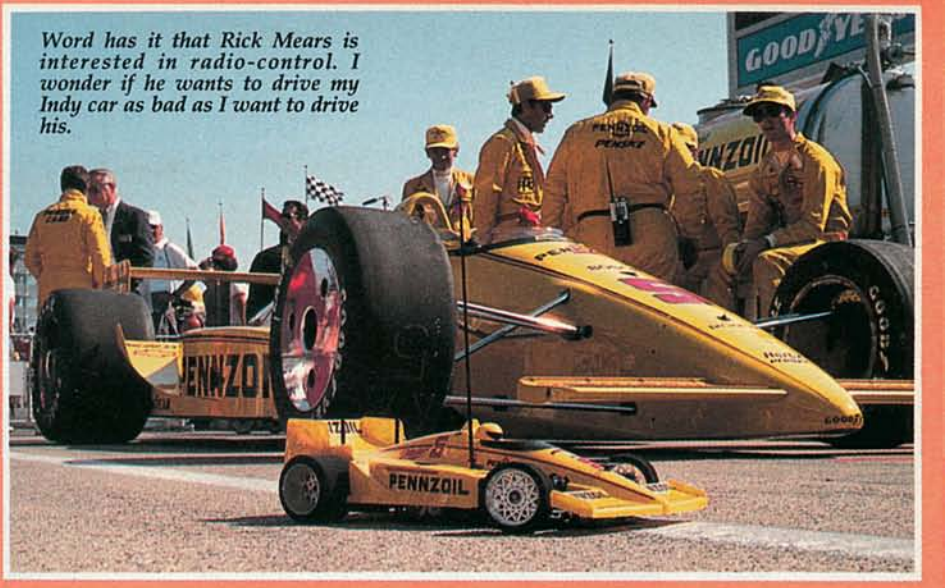
A qualifying speed of 216.214mph landed Danny Sullivan the second spot on the first row. He jumped to an early lead and kept a blistering pace until a problem with the front wing sent his car into the wall in turn 2 on the 102nd lap.

was so young, averaging 75mph was quite an accomplishment, and so was completing 500 miles at maximum speed without any serious mechanical failure. The race cars carried two people, one obviously the driver and the other a mechanic.

The Indy 500 ran as scheduled until 1916, and then, for some reason, the race was scheduled to run for only 300 miles. World War I forced a postponement until 1919, and then the race resumed at 500 miles, and a driver by the name of Howdy Wilcox brought home the checkered flag in his Peugeot. His average speed was 88mph and his time was over an hour faster than that of the first 500's winner.

It wasn't until 1925 that Peter DePaolo, driving a Duesenberg, was able to break the 100mph

Although Emerson Fittipaldi (driving the Marlboro March) couldn't catch Mears for the win, he was able to pass Unser Sr. towards the end of the race to capture second place.



Word has it that Rick Mears is interested in radio-control. I wonder if he wants to drive my Indy car as bad as I want to drive his.

"Gentlemen, charge your batteries!"

ALTHOUGH THE INDY 500 isn't directly related to R/C racing, for many of us, our interest in full-scale racing sparked an enthusiasm that eventually led us to R/C. Through R/C racing, we can all become part of a tradition that started as soon as the first buggy had an engine strapped into it. Racing R/C cars allows those who are fired with the spirit of competition to participate in the exciting world of racing.

Open-wheel racing is just one part of the diverse R/C racing hobby. It provides the excitement of full-scale open-wheel racing, and the *scale* speeds of some of the on-road R/C cars are more than double those of full-size racers.

To date, there's no Indy car kit available for us, but there are a number of on-road cars that can be fitted with an Indy-type Lexan body and painted to match your favorite machine. Tamiya offers three open-wheel 1/10-scale cars that are actually fashioned after the Formula 1 cars of Europe. As with the other available on-road kits, these cars can be fitted with an Indy body, or, since they closely resemble the Indy car, they can simply be painted in a suitable scheme.

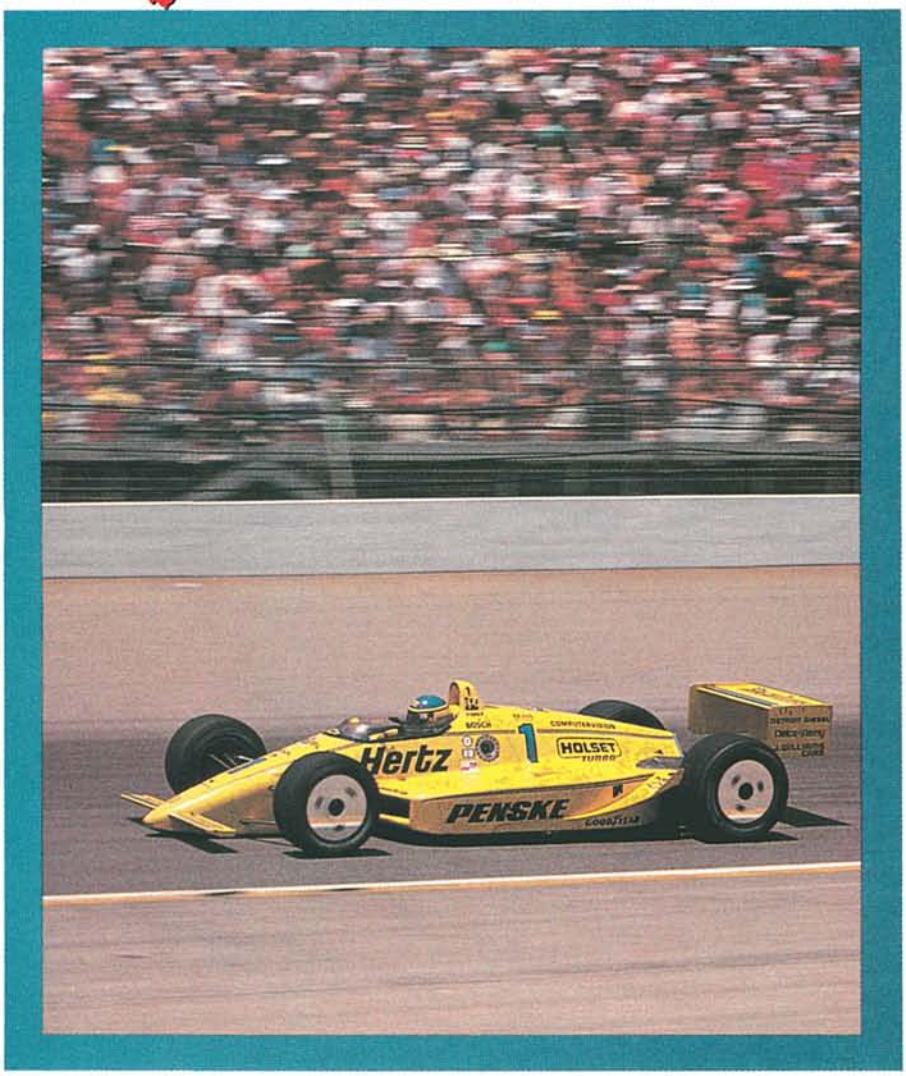
My Indy car is an MRP GP-10 fitted with an MRP March '86 body. The chassis was fitted with a Futaba Magnum radio system using an FP-S131S servo. I prefer the FP-S135S because it's smaller and lighter, but the cut-out in the chassis required a larger servo. Delivering power to the motor is a Tekin ESC 190 electronic speed control. Just before leaving for the race, I decided to finish the GP-10 to match Rick Mears' Pennzoil Z-7. Although the MRP body is fashioned after a March '86 and sports a wing most often used for road-course racing or short ovals, it's almost identical to the new Penske PC-17 driven by Mears. It was a stroke of luck that I just happened to pick the winning car as my model.

It's possible to modify many other available on-road kits in the same way as I modified the GP-10. My first visit to the Indianapolis Motor Speedway has won me over to Indy racing as the world's best oval racing. It has also won a prominent spot in my R/C car line-up. ■

Indianapolis 500™

barrier with an average speed over the 500 miles of 101.13mph. Rene Thomas was able to break 100mph in the 1919 Indy 500 for a one-lap qualifying record, but it wasn't until 1925 that these speeds were maintained for the entire race.

Racing at the Indianapolis Motor Speedway continued until 1942, when it was postponed because of World War II until 1946. In 1962, Parnelli Jones was the man to beat, with the fastest qualifying lap record that broke the 150mph barrier in the Agajanian Willard Special. Although this was a blistering pace, Jones wasn't able to put that speed to good use during the race, falling back in the field to finish the race in 7th place. Roger Ward took the checkered flag in the Leader Card 500 with an average speed of 140.293mph. Len Sutton (also driving a Leader Card 500) finished 2nd, only .51 second behind the winning time. In 1977, the next barrier of 200mph was broken by Tom Sneva, driving a Cosworth-powered McLaren for a one-lap qualifying record of 200.535mph.



Each year, qualifying lap records are broken, and the record is now 219.198mph, set by Rick Mears driving a Chevrolet-powered Penske PC-17. This follows the trend apparent during the previous 71 Indy 500s; qualifying speeds are always faster than those of the previous year. The racing technology was, and still is, advancing at such a blistering pace that this unique breed of racer is continually able to travel faster than was ever thought possible.

Aside from all the mega-buck machines and the elite drivers who pilot them, the track itself has an indefinable mystique, and it challenges even the best drivers and the most talented designers.

The Indianapolis Motor Speedway was constructed in 1909 with a tar-and-crushed-stone surface that was soon replaced with paving bricks grouted with cement. The track consists of two long straightaways each measuring ⅝ of a mile, and at both ends of the long straights, there are four ¼-mile turns, each 60 feet wide with a banking of 9 degrees and 12 minutes. Like the long straightaways, the short straights narrow to a width of 50 feet coming out of the turns and turn ⅛ of a mile on the odometer. The Speedway occupies just under 560 acres, with the race course covering 433 acres.

From its inception until 1927, the track was owned by Carl Fischer and a few other Indianapolis business associates, and then it was sold to Eddie Rickenbacker. Ten years later, Rickenbacker had portions of the track surfaced with asphalt to increase traction because of the faster speeds at which the cars were by then traveling. Rickenbacker owned the track until the end of World War II, and in 1945 it was bought by Anton Hulman Jr. The Speedway didn't see the asphalt machine again until 1976, when most of the track (with the exception of one yard) was paved. A three-foot strip of the track, referred to as the "Brick Yard," was left unsurfaced to preserve something of the tradition for which Indy is so famous.

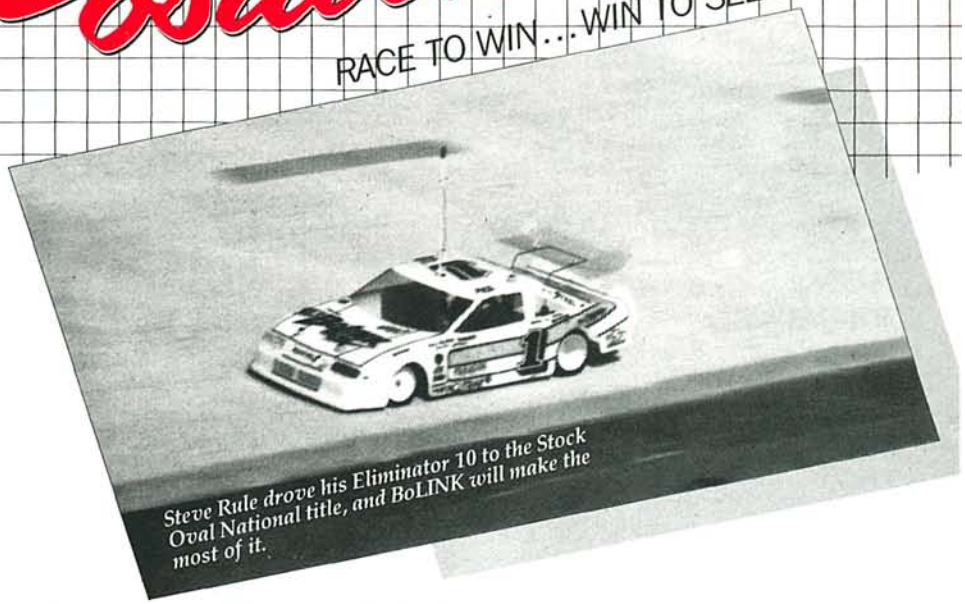
Although the track has changed hands twice and the surface three times, one aspect of racing remains unchanging: the insatiable desire to build a machine that will dominate the Indy.

(Continued on page 136)

The Pole Position

RACE TO WIN . . . WIN TO SELL!

by RICH HEMSTREET



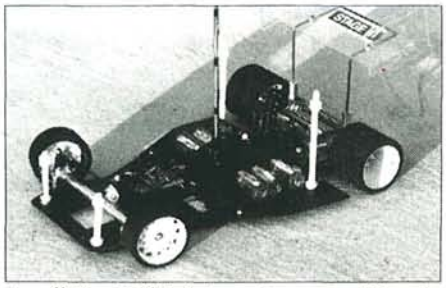
Steve Rule drove his Eliminator 10 to the Stock Oval National title, and BoLINK will make the most of it.

WHEN BILL ELLIOTT and Dale Earnhardt race side by side to the checkered flag at Daytona, the fans go wild, and Ford and Chevy also have a major interest in who wins. As the NASCAR saying goes, "Win on Sunday; sell on Monday." If Elliott's T-Bird wins, Ford will attempt to make the most of it, and the same goes for Chevy, if Earnhardt wins. The same holds true for BoLINK* at Lake Whippoorwill International Speedway; you can bet that Steve Rule's win at the 1/10 Oval Nationals will show up in BoLINK's advertisements. When Dave Hechler won the Stock Car Championship at Lake Whippoorwill in March '88, TRC* was quick to develop an ad about his—and their—success.

Several manufacturers have reported increased sales after a major victory, and orders start coming in even before any race reports or advertisements are published. Trinity*, BoLINK and Twister* are finding out that what works for Ford and Chevy works for them: Race to win; win to sell.

The high-speed racing at Lake Whippoorwill continues to catch the attention of manufacturers. At last year's Car Action Weekend, several new 1/10-scale cars were introduced, so don't be shocked if at least one or two more new cars debut at the second annual event. The manufacturers are taking 1/10-scale on-road racing *very* seriously. Recently, drivers have been switching teams enthusiastically, as manufacturers try to improve their odds of winning. Track announcers at major events can no longer keep up with who's driving what (and with which motor). At the 1/10 Nats in Tulsa, one modified A-Main driver's car had CAM* stickers all over the body, but a Reedy* motor was bolted in. Another driver was listed in the program as driving a TRC Pro 10, but he drove a BoLINK Eliminator 10 in the A-Main.

At the Lake Whippoorwill Oval Nationals, the 1/12-scale Associated 12L driven to victory by Jim Fuller was almost stock; Fuller had only put the car together in time for one or two practice runs before qualifying started. His only change for running on the speedway was the replacement of the front springs with solid spacers, (Fuller said this took the "twitchiness" out of the front end.)

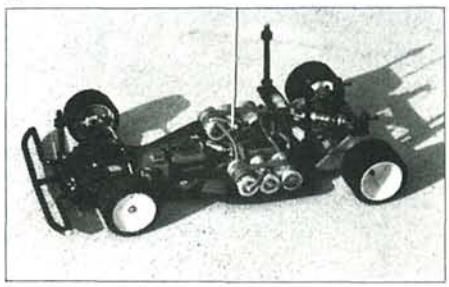


An off-the-shelf Twister motor powered Dennis Vindedahl's TRC Pro 10 to the Modified Oval National Championship.

Steve Rule's Eliminator 10 was also very close to being box stock; the only noticeable change was that he added a bracket on which to mount the rear body posts. This permitted the use of shorter body posts, which make for a more solid mounting system.

Dennis Vindedahl's TRC Pro 10 was powered by a Twister motor that was right off the shelf. Not a special hand-wound motor, but a packaged motor in a stock Pro 10 won the Modified Oval title; that should give *lots* of racers encouragement to enter the big events!

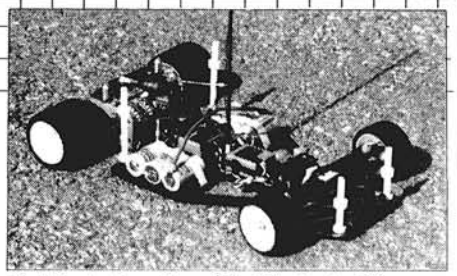
In Tulsa, I took a look at Buddy Bartos' version of the BoLINK Eliminator 10. At the rear of the car, Bartos had switched to a monoshock coil-over, and he also connected an anti-sway bar to the rear pod. An Associated* T-ball was installed in the T-bar, giving the rear pod more flexibility. To make the front end more durable, Bartos had removed the rubber grommets that controlled the caster setting and installed a fiberglass crosspiece to hold the tops of the kingpins in place.



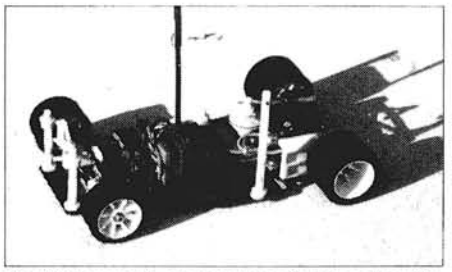
This nearly stock Eliminator 10 won a national title for Steve Rule.

Most racers are finding that it isn't very hard to get their 1/10-scale on-road cars to hook up; right out of the box, most cars are in the ballpark. The driver just has to figure out which tires to use and how to treat the tires with a traction additive. While some drivers will continue to tinker with their cars, the majority will simply be able to concentrate on improving their driving through practice.

A new R/C organization was recently formed: The National Radio-Control



Bud Bartos' version of the Eliminator 10 uses a monoshock in the rear.



Jim Fuller used an unsprung front end on his winning Associated 12L.

Truck Pull Association (NR/CTPA). It has published rules dealing with 1/10- and 1/12-scale truck pulling, and David Sproul, the president, hopes to draw the various clubs involved into one organization. The rules encompass quite a few classes, but they leave a lot of room to be creative. Because truck pulling is a non-contact sport, Sproul hopes drivers will go to great lengths to make their trucks appear realistic. Monster truck competition with car crushing and slalom courses are planned for the future. If you're interested, contact them at NR/CTPA, 246 Pine Run Rd., Rochester, PA 15074.

That's all till next month. Good racing, and try to keep it off the walls.

**Here are the addresses of the companies mentioned in this article:*

BoLINK R/C cars, 420 Hosea Rd., Lawrenceville, GA 30245.

TRC, P.O. Box 478, Oakboro, NC 28129.

Trinity, 1901 E. Linden Ave. #20, Linden, NJ 07036.

Twister Motors, 657 E. Arrow Hwy., Suite H, Glendora, CA 91740.

CAM Racing Motors, Rt. 3 Box 680, Huntersville, NC 28078.

Reedy, 3585 Cadillac Ave., Costa Mesa, CA 92626.

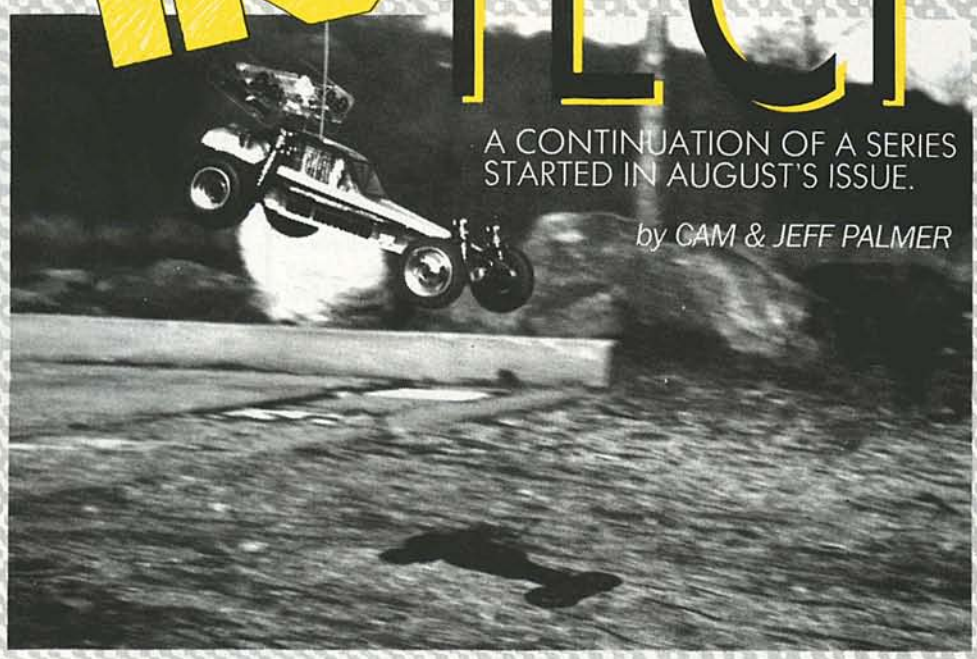
Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626. ■

PART II

RC 10 TECH

A CONTINUATION OF A SERIES STARTED IN AUGUST'S ISSUE.

by CAM & JEFF PALMER

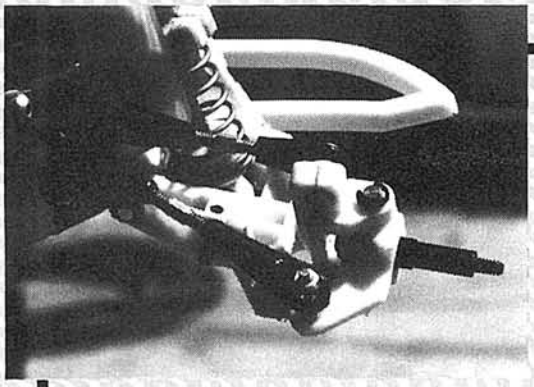


GETTING THE MOST FROM YOUR RC 10 WITHOUT SPENDING ALL YOUR MONEY

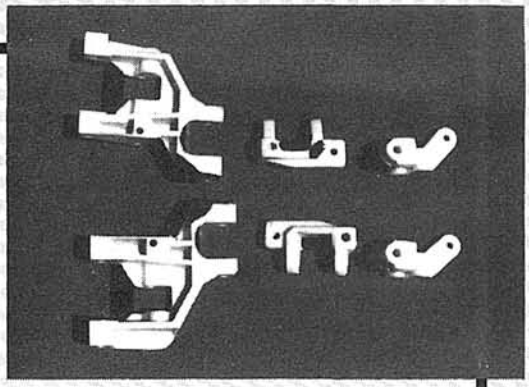
THE GOAL OF our modifications is to increase the bite of the front wheels and so allow the Associated* RC 10 to make tighter turns. This requires a large number of modifications to the nylon and fiberglass parts of the suspension system. Most of the modifications will be done on a cut-and-test basis, i.e., you'll cut, assemble, check for clearance and binding, and then repeat this process until it works correctly. For the front suspension system, "correctly" means that each part should move under the influence of its own weight. So, let's get started.

Some Early Decisions

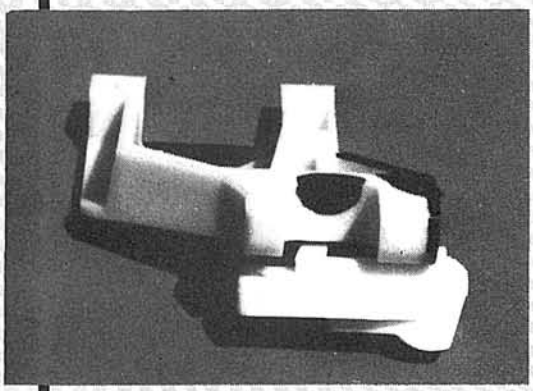
The stock tie rod and ball-joint system work well when they're new, but as minor accidents and regular wear take their toll, the ball joints will reach a point where they'll pop apart easily. Team Pit Stop* makes a replacement tie rod and ball-link kit (Steering and Suspension Arm System, No. 4000), as does Parma*, which makes Heavy-Duty Upper Links and Tie Rods (No. 12828). The Team Pit Stop kit is about the same weight as the stock system, while Parma's is twice as heavy. Being weight conscious, we decided on the Team Pit Stop (TPS) kit. TPS also makes turnbuckle tie rods, which allow you to adjust the tie-rod assembly without removing it. You simply use a ⅛-inch crescent wrench to adjust the turnbuckle. *Easy!* We're using four sets of ⅞-inch



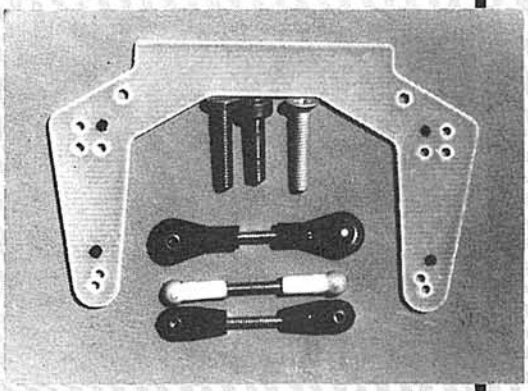
Detailed photos of the turnbuckles and ball joints. Note screw and nut placement.



Remove blackened areas. A-arm, block carrier and steering block.



A view of the A-arm showing the area to be removed for the block-carrier movement.



Comparison photo of ball links and steering-mount screws. Steering-mount screws: stock aluminum (left), MIP's (center), and stainless steel (right). Ball links: stock (center), Team Pit Stop (top), and Parma (bottom).

turnbuckles (TPS No. 4010).

Where possible, we've replaced the stock RC 10 parts with lighter after-market parts. The first way to reduce weight is by replacing the stock screws and nuts with a TPS Lightening Kit (No. 5000). This kit offers a complete set of aluminum screws and nuts to replace the corresponding stock parts, and these replacements are 2 ounces lighter. Another ½ ounce can be shed by using RC Performance Specialties* (RCPS) Titanium Suspension Pins (No. 610). To protect our investment in titanium hinge pins, we substituted RCPS's No. 510 Heavy-Duty Suspension Retaining Rings for the stock E-clips. In all, we trimmed off 2.5 ounces without doing any real work or reducing strength. Now, that's easy!

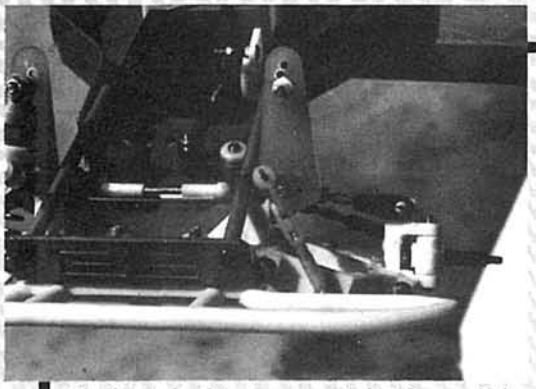
Front A-Arm Modifications

Before step No. 7, we'll do major surgery on the A-arms. These modifications can be done with a hobby knife, but it's faster with a Dremel Moto-tool and a No. 192 routing bit. Review the photo of step No. 7, noticing the square opening in the middle of the A-arm; remove the top side of the square, so that it will be open to the outside. This cross-member restricts the lower limit of the A-arm movement by hitting the shock.

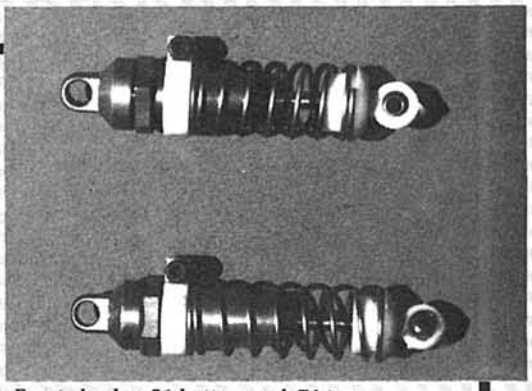
The next modification to the A-arm is the removal of the upper edge of the back of the "U" where the block carrier fits. Notice the brace on the rear of the block carrier; with the increased travel distance of the A-arm, you must increase the movement of the block carrier to keep the wheels at the correct angle for maximum traction. Rout the A-arm so that the front axle will point up to a maximum of 60 degrees.

Look again at the photo of step No. 7; see a triangular hollow area? Cut an angle from the top edge of the triangle to the right-hand bottom edge (for you trig buffs, the hypotenuse side). The base of the nylon A-arm is about 1/16-inch thick; *don't* cut into this base. Cut away the nylon on the back of the A-arm block-carrier support. Start cutting ¼ inch from the bottom outside edge and cut toward the top.

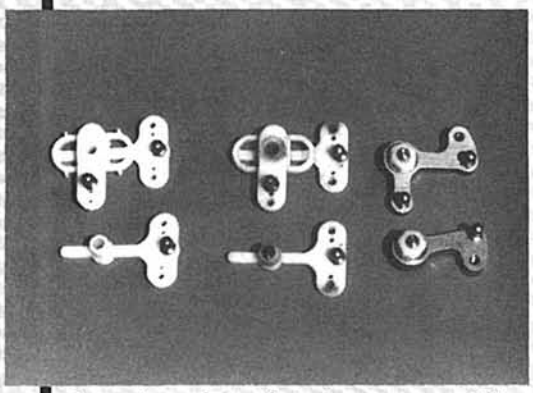
You can also determine where to start by inserting a hinge pin with an E-clip. The outside edge of this clip is approximately 1/16 of an inch away from the pin. *Don't* cut any of the area covered by the E-clip; leave a 1/16-inch base, too. Cut away any nylon that would stop the travel of the steering-block arm, except the block carrier. Round off all the edges above the



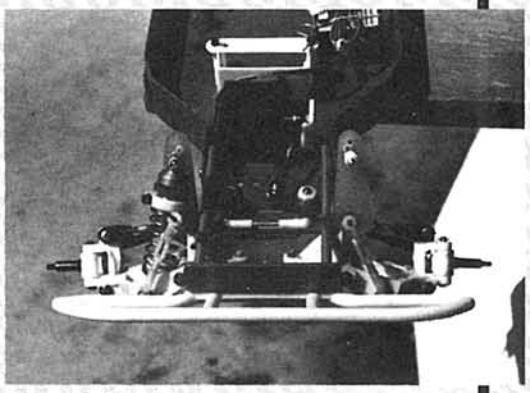
The front shock is now mounted in the new hole drilled in the shock tower for increased suspension travel.



Front shocks: .51 bottom and .71 top.



Comparison photo of stock servo-saver (left), modified servo-saver (center, turn stops removed) and Team Losi bell cranks (right).



Completed front end.

E-clip and beneath the arm of the steering block.

One final note on the A-arm: Use a No. 30 drill bit to clear the hinge-pin holes. Manually work the drill bit into the holes until the hinge pin moves without binding.

Block Carriers and Steering Block Modifications

After the A-arm mods, these modifications are a piece of cake. Refer to the photo for step No. 9. The nylon material that forms the back wall inside the "U" for the steering of the block carrier must be removed. Now, swap the two block carriers, mounting the left block carrier in the right A-arm and vice versa for the right block carrier. To get the block carrier to move freely, you may need to sand the area around the hinge-pin hole. On the new front side of the block carrier, remove the corner of the steering-block mount that interferes with the movement of the upper ball link.

On the steering block, remove the steering-block stop (that small nylon arm opposite the steering arm), and then clear the king-pin hole as you did earlier for the hinge pins on the A-arms.

After assembling the A-arms, block carriers and steering blocks, the A-arms should drop and be stopped by the aluminum chassis when you pick up the car. The block carrier should fall over and hang down. If you're still experiencing some binding, check the hinge-pin holes; the nylon part should spin freely on the hinge pin. If the hinge-pin holes are OK, lightly sand the surface contact areas between the nylon parts.

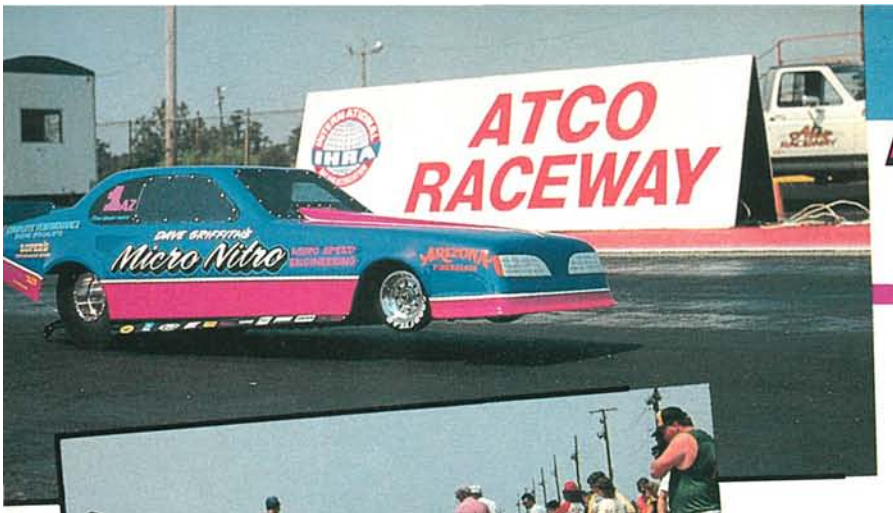
Front Shock Tower

In the photo of step No. 14, the ball joint is being installed on the top inside mounting hole. To complete the square, use a 3/32 drill bit to drill a fourth hole, below the ball joint and across from the lower outside hole. Use this hole to mount the tie-rod from the shock tower to the block carrier. This will allow the wheels to flare out at the bottom of a bump or jump, so increasing steering control. If you're using the stock front shocks (.56) to mount them, drill a 3/32 hole 1/4 inch below the top shock-mount hole. If you have the .71 shocks, use the lower of the two shock-mount holes.

Steering-Ball-Link Modifications

Team Pit Stop makes an excellent product, but

(Continued on page 99)



ROLLING ATCO Raceway!

1/4-SCALE SPRING NATIONALS

Photos by Eric Goldschrafe.

Above: *"Micro Nitro" was one of the quick 1/6-scale funny cars featured at Atco; car was built by Dave Griffith, from Phoenix, AZ.*

by ERIC GOLDSCHRAFE

Pre-race car show had approximately 70 drag cars lined up along Atco's quarter mile.

FOR A LONG TIME, Atco Raceway in New Jersey has been a well-known dragstrip and the location of many big IHRA events. On Memorial Day weekend, 1988, Atco hosted another major meet—the first national event for R/C drag cars: the Quadra/Superlube IRROQ Quarterflash Quarter-Scale Spring Nationals. Besides the 1/4-scale dragsters and funny cars (F/C), there were special classes for 1/10-scale electric cars and 1/6-scale fuel funny cars, and with large cash awards up for grabs, entries came from all over the US and Canada.

Sunday's time trials showed that the biggest problem for all types of cars was traction.

THUNDER at

Ed Rink, Dave McFadden, Jerry Tyler and Terry Bays (the Camden Tool gang) took the award for Best-Engineered 1/4-Scale Car.

Anybody with lots of horsepower saw his or her elapsed times (E.Ts.) go up in smoke as the big slicks spun freely off the line. Tire-heating burnouts helped some, but the savvy racers went looking for ways to loosen up their clutches. By the end of a hot day, and after several runs, a few had the elusive combination dialed in.

The big news was the Pacesetter* factory car that ran a super-low 5.12 E.T. with the new Solo engine, with a back-up run of 5.15 recorded while racing heads-up against the Cobra dragster, which turned a 5.50. Everyone looked forward to a shootout between these two cars during the next day's eliminations. That night, while most were content to tune and adjust their cars for these eliminations, Bill Sundstrom stayed up repairing his Sun Racing Products* rail dragster, which had been damaged during a time-trial run by an encounter with a very unforgiving guard rail.

Monday promised to be even hotter than the day before, and this had everyone worried again about traction. During the morning's time trials, spectators inspected the manufacturers' displays in the pit area. Many of the fastest cars were from these manufacturers, including Pacesetter, M-K Engineering*, Fine Design*, New Era Products*, Inter-Fab Custom Machining*, and PDI*.

During the noontime ceremonies, approximately 70 cars lined up along the edge of the strip and were judged for finish and engineering. Awards were as follows:

"Best Paint" Winners

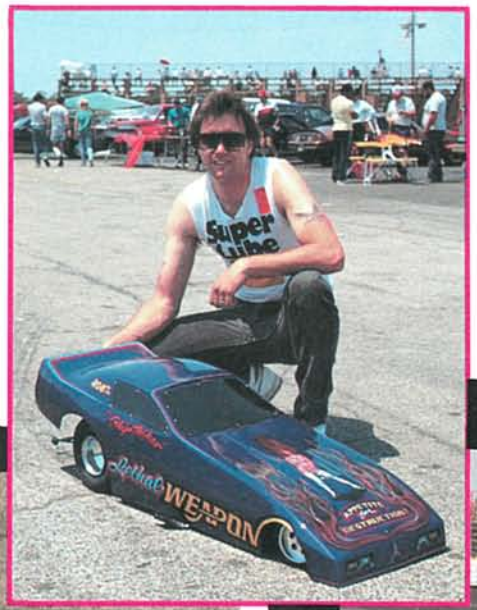
1/10-Scale: Dave Irrgang—F/C
1/6-Scale: Dave Griffith (of Phoenix, AZ)—"Micro Nitro" F/C
1/4-Scale: Jim Parodi—Tech Toys* F/C

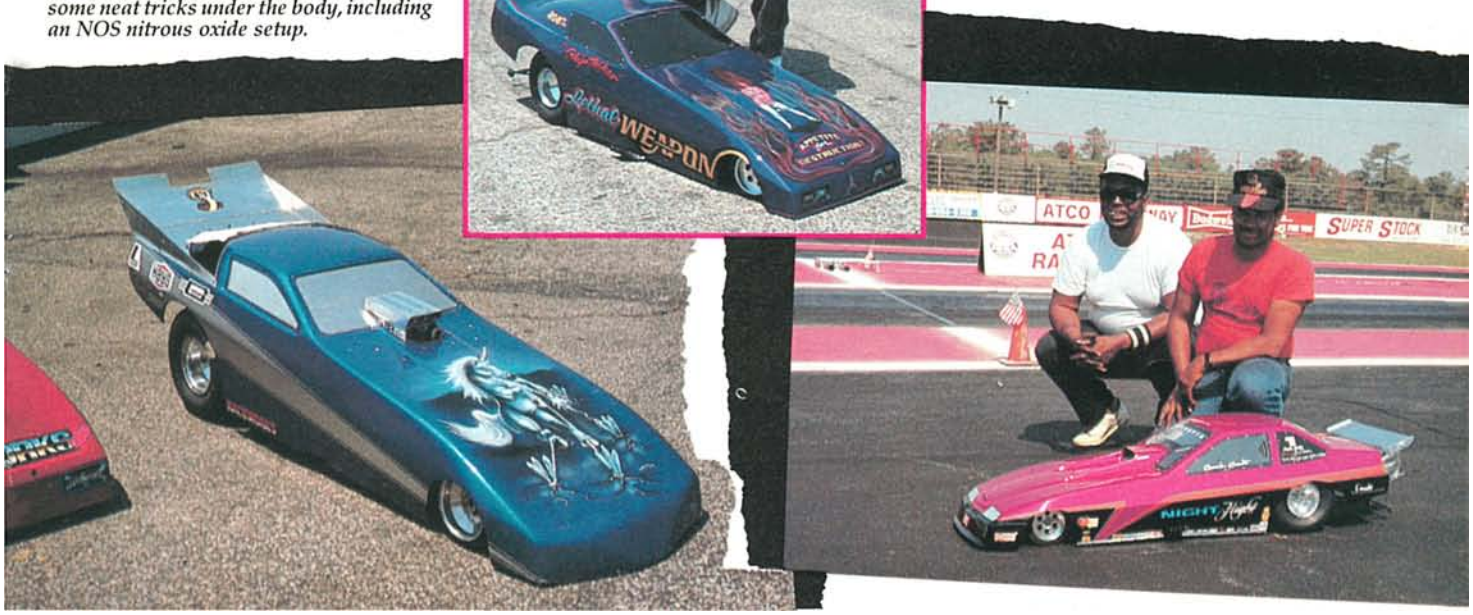
"Best Engineered" Winners

1/10-Scale: Tom Aument—scratch-built dragster
1/6-Scale: Mike Kopchik—M-K Engineering F/C
1/4-Scale: Ed Rink, Dave McFadden, Jerry Tyler, Terry Bays (the Camden Tool Gang of Millville, NJ)—scratch-built rail dragster

When the cars had been moved back into the pit area, the Chrondek timing equipment, which is used to clock the

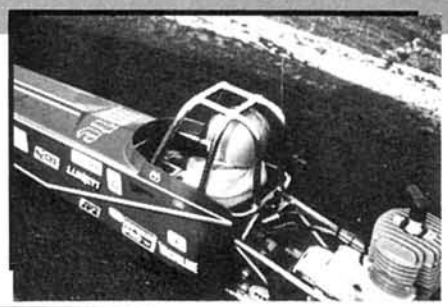
Far Left: *The Raceworks gang from Ontario, Canada, showed up with two beautiful cars. The drivers are Scot Haviland and Terry Howard.*
Left Center: *"Reuben's Rocket," a beautifully-finished quarter-scale dragster, was built by Reuben Otero, of Brockton, MA.*
Below: *Terry Howards' 1/4-scale funny car.*
Right: *This "Lethal Weapon" funny car featured an outrageous paint job by "Pooch," and is owned by Chip Tasker from Boonton, NJ.*
Below Left: *Dennis Smith brought his "Night Flight" quarter-scale funny car down from New York City; car features some neat tricks under the body, including an NOS nitrous oxide setup.*

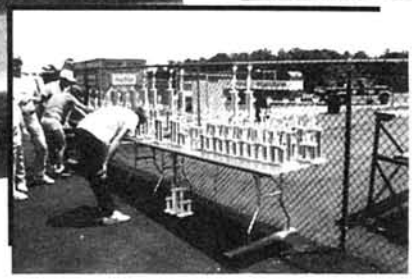




SPRING NATIONALS

Careful staging is the first step to a quick E.T.





Above: *Jimmy Parker's Cobra dragster ran strong all day on borrowed parts; went all the way to "King of the Hill."*
Left: *Impressive table full of hardware was sweetened with cash awards for the winners.*

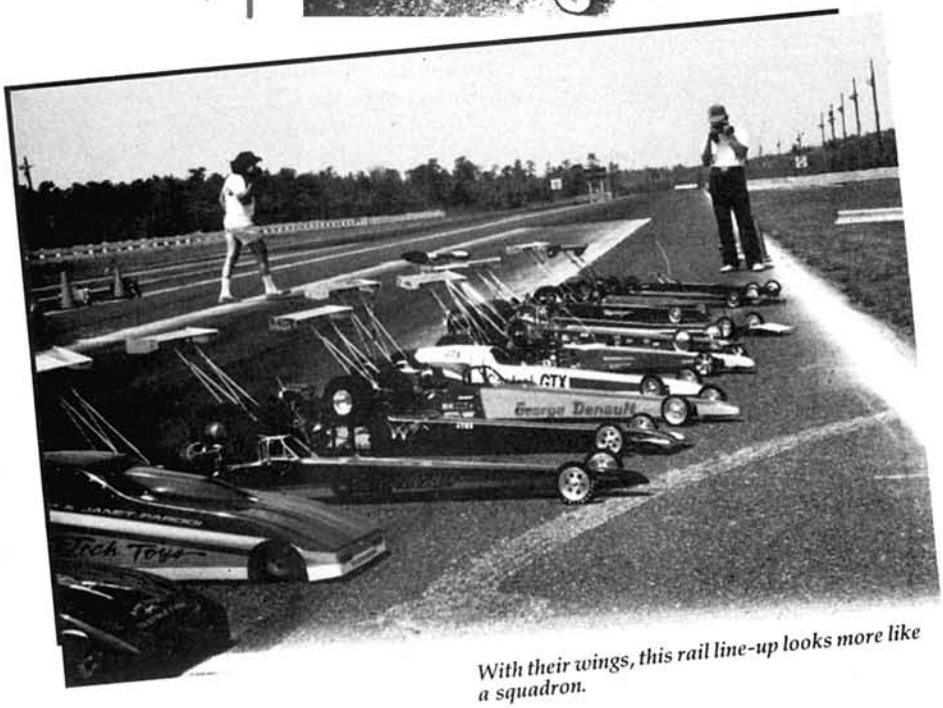
Above: *These ¼-scale pro-stock-looking machines ran in the experimental category.*
Below: *Philip Simms, from Orlando, FL, turned a 2.47 with this Predator-chassied, Twister-powered '55 Chevy doorslammer; juice came from 12 sub-Cs.*

full-size drag cars for 1,320 feet, was reset to read times for the 1/10-scale quarter mile. The class call went out, the cars reported to the staging lanes, and the eliminations began.

The Pro Stock Class was the first to run, and Pete Lord staged his Motorcraft Thunderbird carefully, as his opponent, Anthony Sevorino, rolled his "Holeshot" Viper Pontiac into the beams. Pete's quick reaction time earned him first place with a 5.34 E.T., while Anthony turned a 5.85. The Universal Racing Special from Orlando, FL, driven by Ken Hively, drew a bye run, but Ken didn't stroke it and blistered the track with an unreal 2.59 E.T. The final round pitted Pete Lord against Hively, and the Florida hot-rod downed the Thunderbird with a 2.69 E.T./458.32mph (scale), with Lord recording a 4.64.

In 1/10-scale Pro Comp, the Flying Dutchman Willys Coupe, driven by Chris Irrgang, narrowly defeated Kurt Butler, 3.75 to 3.85. (Drag racing runs in *this* family; "Dutch" Irrgang was a crew member for Grumpy's Toy.) The next run saw Jack Fisk's Detroit Metal Corvette go down to Ken Hively's '55 Chevy shoebox, with Hively cranking out a 3.89 E.T. to a faster, but losing, 2.76. Florida's Philip Simms blew away Zack Aument with the lowest E.T. of the meet—a 2.52. His fast Chevy shoebox with a Predator chassis also recorded the highest top speed, tripping the "eyes" with an *actual* 49.6mph. The semifinal round paired Irrgang's quick coupe with Hively's unreal '55, and young Irrgang reeled off a 4.17/214mph run as the Chevy broke on the starting line. Simms drew a solo pass that put him in the final round against Irrgang's Willys, and everyone figured Simms for the winner. Irrgang read the lights perfectly, and stormed the quarter with a 2.53 E.T./519.71, while the Chevy faltered

(Continued on page 118)

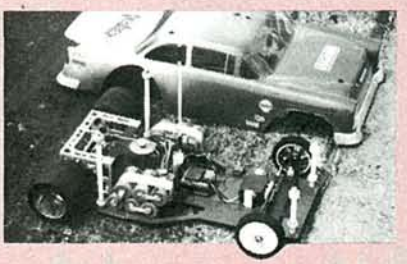


With their wings, this rail line-up looks more like a squadron.

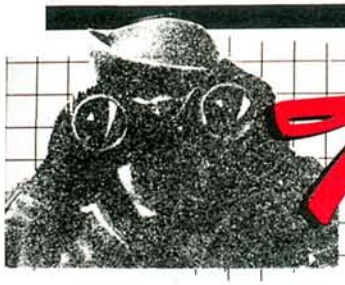
All In The Gearing!

JUST TO CHECK one of my theories, I was curious to see what the hot 1/10-scale machines had under their hoods, and I was right: Most kits sold as drag-race cars just won't "do it" in their out-of-the-box condition.

There were some pretty heavy dudes with some exotic and expensive equipment in the electric ranks, but it took a couple of guys from Florida to show everyone the way to the quickest elapsed times. I'm not trying to make trouble, but I was a little disappointed in the performance of some of the cars that *should* have blown the "little ones" into the weeds. I thank those who took the time to talk to me and show me the details of their cars, knowing very well that their "speed secrets" wouldn't be secret any more.



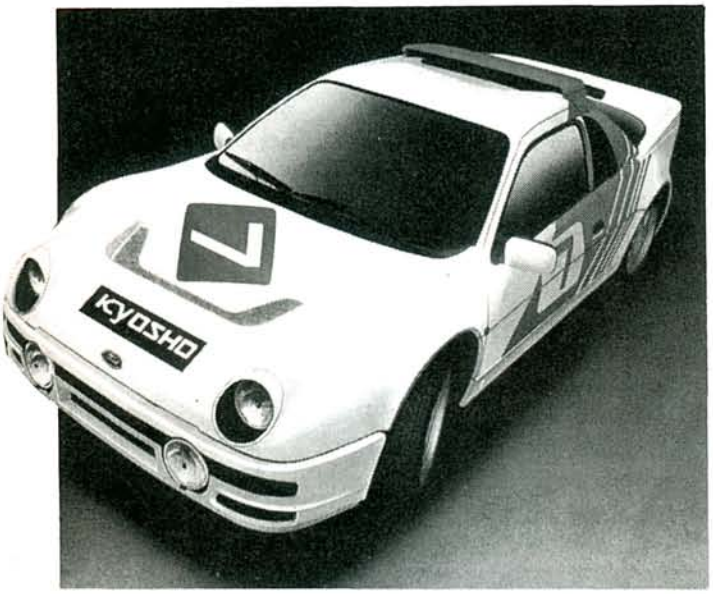
The two '55 Chevy racers were lessons in simplicity—one even ran a road-racer chassis! Their Twister motors did the job, run after run, and each E.T. was unreal. Take a good look at the photos, and you'll see what I mean. The big problem is where to find big-enough gears. The 54-tooth item that comes with most kits, even when used with an 8- or 9-tooth pinion, isn't enough to let a hot wind cook. You spend $80 for a motor that will crank up to 100,000rpm, but it will never see *half* this unless you gear it up to 10- or 12-to-1 (maybe more—who knows?). Some competitors had bigger ratios, but I don't know where they get them. Can someone out there enlighten us? I'll keep you all posted as I find out more about this, and I'll also get to show you some mighty quick cars! ■



The Inside Scoop

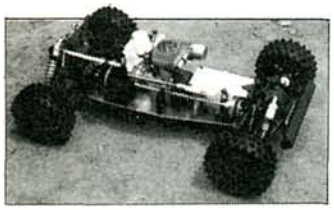
by CHRIS CHIANELLI

THE R/C CAR industry is rapidly advancing, with new products being offered at a head-spinning rate. So, I'll make manufacturers nervous, but feed you R/C squirrels who are hungry for info, by bringing you a special report on security leaks and "late-in" items. Here goes!



KYOSHO FORD RS200

LOOKS AS IF someone at Great Planes has been holding out, but it will do them no good! My friend/spy in Japan comes through again. (She's great at infiltration.) My source tells me this Ford RS200 rally car is a 1/10-scale 4WD OS-10FSR-powered machine.

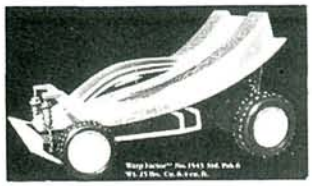


It's hard to tell from the photo, and Ms. Lingafoon was no help, but the differentials appear to be chain-driven or belt-driven off a shaft. The car is pictured both with on-road tires (body on) and off-roaders (body off). At this point, we don't even know if the car will be brought into the country, let alone what tires will be offered with it. We do know those are

KYOSHO UNNAMED 1/12

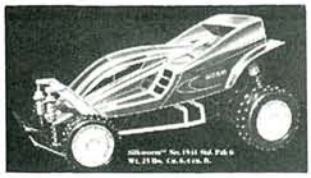
Option House Gold shocks on the car. Also leaked to us is this new, as-yet-unnamed, 1/12-scale on-road car from Kyosho. Note the large Gold shock on top and the smaller lateral ones just to the left of the body posts. New, to keep you updated.

* * *



WARP FACTOR

CHECK OUT THESE wild styles! This is L.A. Wheels' idea of what an off-roader should look like. In particular, the Warp Factor can be described as RADICAL—a radical departure from the common off-roader. What you see here is part of L.A. Wheels' 1/10-scale series. The cars are



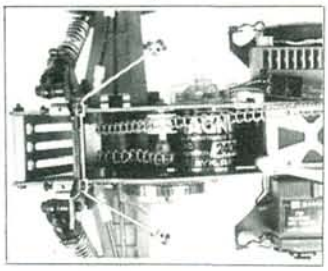
SILK WORM

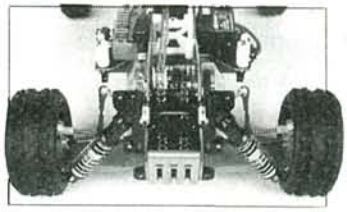
ready to run and have proportional radios. Other features include 2WD, upper and lower wishbone front suspension, RS-540 motor, and low-voltage indicators on both the transmitter and the receiver. If not already done, that intake on the Silk Worm could be cut out to help cool the motor.

* * *

BOOST MID

HERE'S A MID-MOTOR conversion for AYK's Radiant. As a matter of fact, we're going to cover this in our next issue of *RCCA*. If Race Prep imports the Boost,





you won't have to buy a Radiant *and* the conversion kit to get a mid-Radiant; you'll simply need to buy the Boost. For those who already have a Radiant, the conversion kit will still be offered.

* * *

DOUBLE DARE

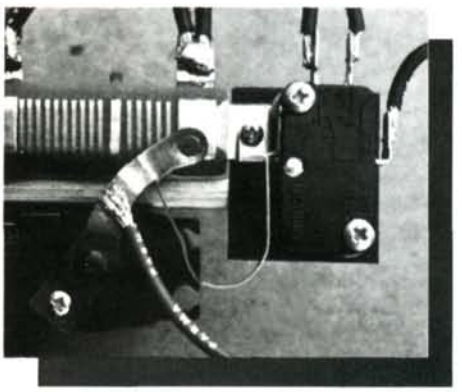
WELL, HERE IT IS: Kyosho's answer to the Clod Buster—its twin-motor monster truck, the Double Dare. Back in the June '88 issue of *RCCA*, I showed a picture of this truck in my "Inside Scoop" special report called "Nurnburg Mission." I've since received a number of letters saying, "What is it? Where is it? and when can I get it?" To answer your questions: I've already told you *what* it is; as to *where*—still in Japan; and *when*—

here by fall! Kyosho not only doubled up in the motor department, but also in the shock department. The Nissan hard body should be very popular; I hope the version that reaches us retains high-rise dual quads through the hood. Looks like there's going to be a Double/Clod shootout in the future.

* * *

THE BUDGET RACER

by DICK BRINTON



Make sure reverse microswitch doesn't get tripped until wiper is at full reverse position. Reverse is to the right of the resistor.

THE SPEED CONTROLLER... RELIABILITY DOES NOT HAVE TO COST A SMALL FORTUNE

AT THE END of the first article in this series, I said I'd look next at suspension and track setups, but Executive Editor Chris Chianelli sent me some wire-wound speed controllers to test, and I think this is a priority, so I've "bumped" suspension to my next column.

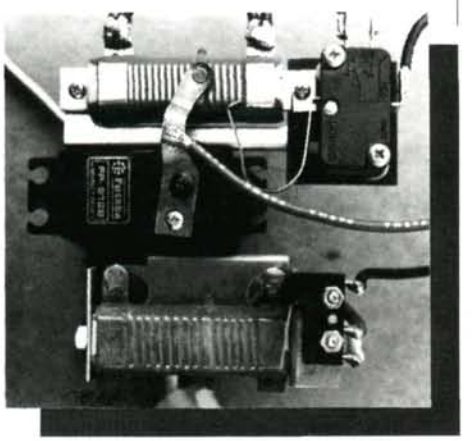
The speed controller; every R/C car has one. While some are simply servo-controlled on/off switches, others are considerably more sophisticated and provide a lot more than just full power or no power.

Let's take a look at speed controllers to see how they control motor speed, and then we'll explore the speed controller's effect on the way our cars handle.

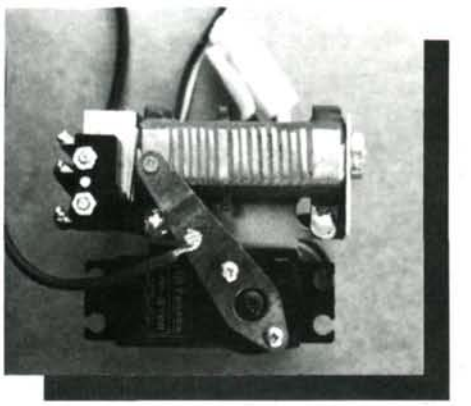
Imagine a garden hose with one end attached to a tap and the other aimed at the vanes in a water wheel. When we turn on the tap, water flows through the hose and onto the vanes of the water wheel, so causing the wheel to turn. If there's no kind of flow control on the hose, whatever water pressure is supplied by the tap will come gushing out of the other end of the hose.

Now suppose we attach a flap or on/off valve at the nozzle end. With our flap valve, we can shut the water all the way off or we can turn it on all the way, but there's no in-between position. We can either stop our water wheel, or make it go like crazy.

Now let's replace our flap or on/off valve with a three-way valve, adjustable to off, half and full power. We now have better control of the speed of the water wheel. It's not complete control, but at least it's better than simply "on" and "off."



A comparison of Parma's (top) and BoLINK's (bottom) microswitches. The size difference may be important if space is limited.

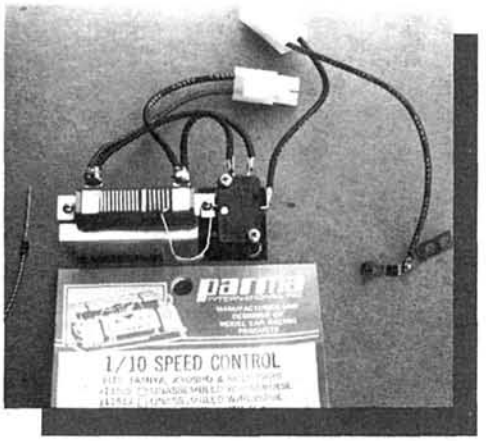


BoLINK microswitch on servo. It's much easier to set up. Notice reverse is to the left of the resistor.

Now let's go one step further and replace our three-way valve with a fully adjustable valve. We can shut the water off completely, let a trickle through, a little more, a lot more or a full-blast jet. Whatever we choose, we can dial-in with our fully adjustable valve.

If we imagine the tap as our battery, the hose as the wiring, the valve as the speed controller and the water wheel as our motor, the picture becomes clear. The flap valve represents a simple on/off switch, the three-way valve represents a three-step speed controller and the fully adjustable valve operates like a wire-wound speed controller.

But what about the effect on handling?



Parma's No. 11518, assembled. One-tenth-scale controller. Note voltage-dropping diode at left.

We're in a race and there's a car breathing on our back bumper. We dive into that sharp turn at the end of the main straight. The track is sandy and dry, and we desperately need a light throttle touch to keep from spinning out. If we're lucky, we have a wire-wound speed controller and the guy or gal behind us has a simple on/off switch. He or she spins out, but we pick up half a lap. Of course, if we have the "sudden" speed controller and the other racer has a wire-wound, *we'll* be the ones who lose that half lap.

A good speed controller is a real help in controlling a car under difficult circumstances. The finesse of a controlled touch wins a lot more races than does the bull-in-a-china-shop approach.

The speed controllers I tested are wire-wound. A strip of resistance wire is wrapped around an insulator/heat sink. (The wire gets hot.) As the servo moves the wiper across the turns of wire, the resistance changes and the power applied to the motor varies.

Those I've tested have a brake section on the resistor and a reverse microswitch. The brake section will slow the car down, but it doesn't provide any power for backing up; the microswitch circuitry does this. It's critical that the microswitch be adjusted according to the installation sheet and that the directions are followed exactly.

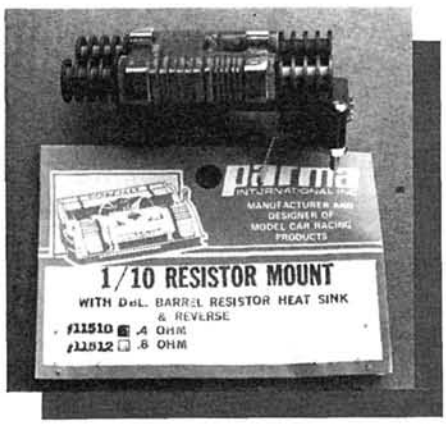
For racing, adjust your transmitter to inactivate reverse. We're not supposed to be using reverse on the track, but the real problem comes up when, in the heat of competition, we hit reverse by mistake. Instant spin-out! Adjust your brakes so that the rear tires won't slide every time the brakes are used.

If you drive on concrete or asphalt, you'll put a lot of stress on the motor/drive train by going from "fast-forward" to "reverse," so expect to replace parts more frequently. A person who uses "reverse" a lot will become very familiar with the inside of the differential!

Let's take a look at the speed controllers I received from Parma* and BoLINK*:

Parma's No. 11518 is a well-made, fully assembled speed controller. It can also be purchased unassembled and without the reverse microswitch (No. 11517 and No. 11515). With the exception of the diode, which allows us to run our receiver off the motor battery pack, all the connections are factory-soldered. The wire is stranded to carry the power and resist "fatigue breaking," the solder joints are well-made,and the contact surface was clean.

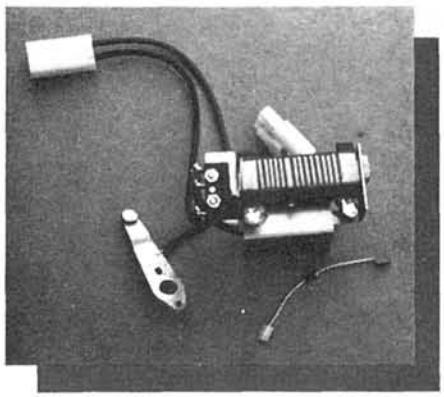
Mike Torres, the manager of my local Radio Shack store, let me use a number of his ohmmeters to check the resistance of the wire-wound resistors. I wasn't sure of the readings I got on my Micronta Multi-Testor, but they turned out to be right on. The Parma No. 11518 measured 1ohm on the power side and .5ohm on the braking side. My only problem with Radio Shack is that I can never make a *quick* visit, as there's always something new to look at.



Parma's No. 11510 double-barrel resistor and heat sink is for heavy current loads; quite safe for 8.4V packs.

Parma also sent its No. 11510 Barrel Resistor. This kit wasn't assembled and seemed to be of good quality. This resistor measured .4ohm on the power side and .5ohm for braking.

Which is best? It depends on your preference. I like the 1ohm, but "You pays your money and takes your choice."



BoLINK's No. 4620 (assembled) and diode. The 4620A is the same, except for Assso-ciated connectors and wiring instructions. This controller also did well with an 8.4V pack.

Remember that, at full power, all the coils of resistance are bypassed in any of these speed controllers, so any difference between them is a result of differences in contact cleanliness, pressure and surface area.

The BoLINK speed controller is well-made, and the factory-soldered joints are very good. It, too, can be purchased assembled or unassembled, but I can't tell you the stock number of this speed controller, as it didn't seem to have one.

Both kits had a reverse microswitch, so you'll have to check with your dealer if you prefer to do without. A diode is included for those who want to power their receivers off the main battery pack, so eliminating the weight of a receiver pack. If you decide against a receiver pack, don't forget to stop before you lose receiver control when your battery's volt-

(Continued on page 58)

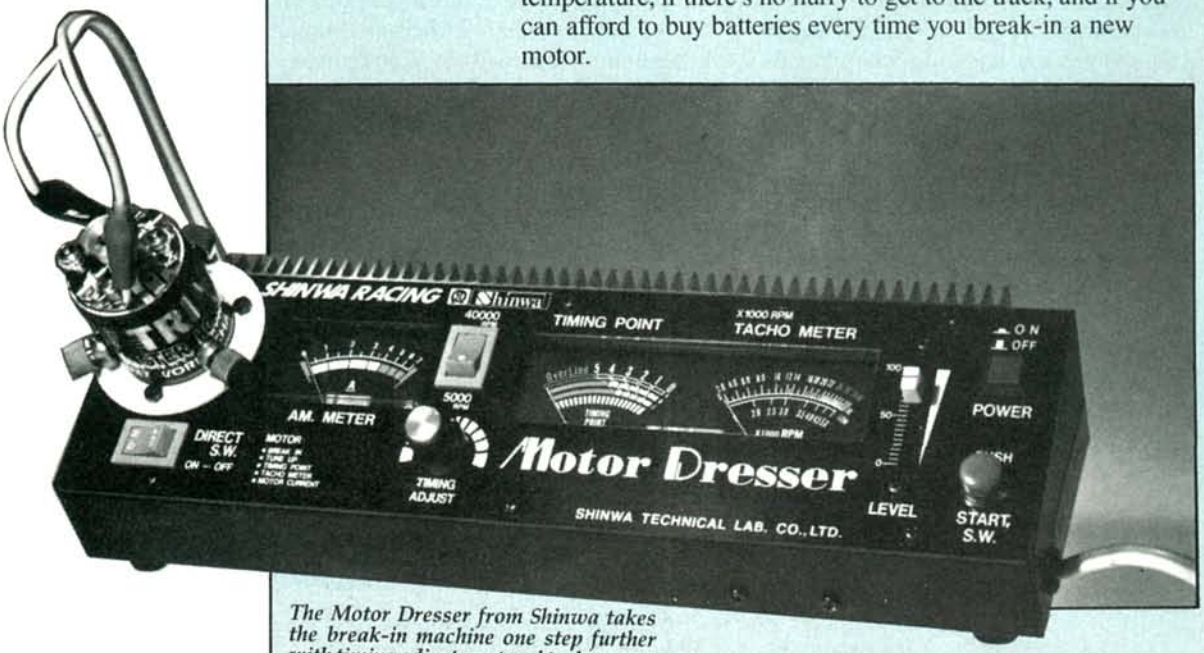
MOTOR BREAK-IN MACHINES

BY STEVE POND

Season your brushes and your motor will really cook.

This Kyosho machine will run from a power supply ranging from 7.2V to 12V DC.

Whether it's in a passenger car or in a full-blown race car, engine break-in is vital. For optimum performance, you must also break-in the electric motors in R/C cars. One method that has proven very effective in breaking-in a motor is to run it at low voltage with no load. This is done by simply taping together two D-cell alkaline batteries to provide 3 volts. The motor is then connected to the batteries and is usually allowed to run until the batteries die or until the brushes are completely seated against the commutator. This is an effective method if you can keep track of the motor's temperature, if there's no hurry to get to the track, and if you can afford to buy batteries every time you break-in a new motor.



The Motor Dresser from Shinwa takes the break-in machine one step further with timing adjustment and tachometer.

For the beginner, this Motor Checker includes a meter to tell you roughly what condition your motor is in.

To help season your motor for racing, a few manufacturers have added motor break-in machines to their product line. These machines allow you to break-in a new or reconditioned motor while operating off a rechargeable power supply, thus eliminating the need for alkaline batteries. Manufacturers of these break-in machines include Aging Machine from Shinwa Racing*, the Moto-Smooth from Cobra International*, A Motor Break-In Machine from Kyosho*, and the Model 405 Break-in-box from Sibex, Inc. These units run off a standard 7.2V or 8.4V Ni-Cd battery, or a 12V automotive battery. This saves you the expense of buying alkaline batteries for every break-in, and it also offers the convenience of seating your brushes wherever there's a 12V car battery or a charged R/C battery. All of the available units have adjustable voltage control that allows you to break-in the motor at a slow pace or at a high speed, if you're in a hurry. The advantage of the units that operate from a 12V power supply is that the motor runs non-stop until the job is done. Operating from a 1200mAh Ni-Cd will also do the job, but it only lasts about 15 minutes. The prices of these machines range from $25 to $80. Determine your price range and which power supply best suits your needs.

A step above the break-in machine is the Motor Dresser and Torque Checker from Shinwa Racing. The Motor Dresser has a motor mount attached to the housing that holds the motor steady during testing. A small magnetic pick-up is attached to the motor prior to installing it on the Motor Dresser. Once in place, the power leads are attached to the motor, and you're ready to do some testing and maintenance. The Motor Dresser includes an amperage meter, timing-point meter and a tachometer. When you test (especially with modified motors), you can observe the fluctuation in rpm and amperage draw as the motor timing is changed. The timing-point meter will show how much the timing has changed. The Torque Checker determines in kg/cm how much torque the motor has. It has a scale to measure the amount of torque, and a 60amp amperage meter to monitor current flow. When adjusting timing on modified motors, you can also monitor the effect that timing has on motor torque and energy consumption.

This new breed of motor testing and maintenance equipment eliminates a few more steps and headaches in preserving your R/C powerplant. The motor is the heart and soul of your R/C racing machine: Take good care of it!

Here are the addresses of the companies mentioned in this article:

Shinwa Racing; distributed by Andes Hobbies, P.O. Box 3077, Laguna Hills, CA 92654.

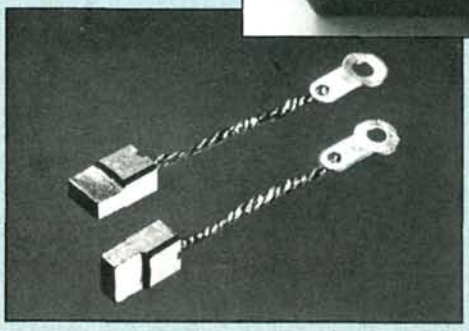
Cobra International, 1235 Lowery Dr., Norfolk, VA 23502.

Kyosho; distributed by Great Planes, P.O. Box 4021, Champaign, IL 61820.

Sibex Inc., 1088 Kapp Dr., Clearwater, FL 34625. ■

Above: *The Shinwa Aging Machine includes an LED scale to indicate what percentage of power you're using from the supply battery.*

As with the other machines, this Sibex unit is adjustable from 3V to 12V to allow you to break-in your motor at low or high speed.

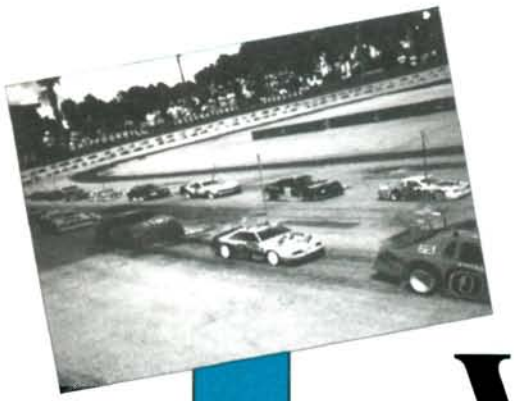


To ensure proper performance, these replacement brushes would have to be worn to fit the contour of the commutator.

CAR ACTION WEEKEND PREVIEW

BEHIND THE SCENES

by STAFF



The 1987 Car Action Weekend drew 180 entries in this spectacular Concours line-up. What will '88 bring?

WHEN THE DUST SETTLES on Sunday, September 25 at Whippoorwill Speedway in Orlando, FL, a national champion for both manufacturers and drivers will have emerged.

For two years in a row, Buddy "The Legend" Bartos from Amherst, OH, has completely dominated the superspeedway. During his two-year reign, he drove CAM*-powered cars. His first win came in a Composite Craft* Predator; the second, in a TRC* Pro 10. In early 1988, he left CAM to join the Trinity*/TRC Racing Team. Buddy arrived at the No. 1 pit in March with high expectations of winning his third championship, but his hopes were soon dashed when one of his team members, Dave Hechler, set out to break all his previous records. Bartos has again joined the CAM team, but he hasn't yet decided which car he'll be driving. There's *one* thing for sure: He wants to regain the championship.

Dave Hechler will be back to defend his title, driving once again for the Trinity team. Dave will try to prove to the world that he's the No. 1 Grand National R/C driver. Rich Howart will also be back, racing for Team Peak Performance*. Rich placed second to Hechler last year, driving a Peak-powered VicFor. This year, he'll drive a Lucas Agitator.

What's going to happen this September is anyone's guess, but let's take a look at what goes on behind the scenes:

Trinity's Ernie Provetti hopes to continue his winning streak by having Hechler, Joel Johnson and Mike Geim at the wheel: Dave in a TRC Pro 10, and Joel and Mike in Composite Craft Predators.

Mike Reedy, of Reedy Co.* has made a tremendous effort to produce a superspeedway motor, and it looks awesome. Jim Fuller, 1/12-scale Grand National Champion (and dominator of this field), will be one of Reedy's top drivers, running another Composite Predator.

Twister's* Mike Walker *has* to be smiling about this event! The Twister motor set the pole last year, and Twister won the Region Two Championship with Steve Swindle driving his BoLINK* car to victory. The National Oval Champion, Dennis Vindedahl of Wisconsin, was running this killer motor in a TRC Pro 10. This year, Twister will have both Erick Soderquest and George David driving BoLINK Eliminator 10s.

Nowhere is the competitive spirit more apparent than at the Lake Whippoorwill International Speedway's drivers' stand.

Checkpoint's Jim Greenmeyer came to last year's race and was amazed at the revs these motors turn. He went back to the factory and started testing. Big Jim picked up a local driver, Paul Davis, and started track testing. Paul now has his hands on the Twister Motor, and his Lazer Lite* car has been dominating the Saturday race program. Look out in September! Here comes Big Jim and team for some serious racing!

Rich Howart, who had a great race in March, but saw Hechler just a few seconds ahead at the finish, will be back

(Continued on page 56)

The awards—like this 1/10 Trinity Top Amateur Driver Award—will be the goal of even more contestants in '88.

CUT THROUGH THE LOCAL COMPETITION WITH THIS LOW-BUCK 4WD RIDE

A POWERFUL WARRIOR is usually depicted as a muscular armor-clad titan on a silver-white horse. In his eyes, we see his confidence of victory, although his sharp sabre is his only defense against a horde of enemies. The Tamiya Plastic Co., distributed in the U.S.A. by MRC*, has now introduced its latest "warrior," the Super Sabre, to the 1/10-scale 4WD Off-Road Class. Tamiya has eliminated the possibility of stretched or broken chains or belts by incorporating a hardened-steel shaft drive system to deliver direct power to all four wheels. Now add a suit of armor

TAMIYA SUPER SABRE

by JOE BRUNI

(with an exciting new aerodynamic polycarbonate body) and the synergy is lethal!

THE KIT: The Super Sabre is a direct descendant of the Boomerang, which was chosen by *R/C Car Action* staff as one of the

SABRE

MRC/TAMIYA

SUPER SABRE

Type ..... 4WD Off-Road
Scale 1/10
Rec. Retail Price $184.99

DIMENSIONS:
Overall Length ..... 15½ inches
Width ..... 9½ inches
Height ..... 5½ inches
Wheelbase ..... 10 inches
Front Track ..... 7¾ inches
Rear Track ..... 7¾ inches

WEIGHT:
Gross (w/rec. bat.) ..... 3 pounds, 8 ounces

BODY:
Type ..... Non-scale aerodynamic buggy
Material ..... Clear polycarbonate

CHASSIS:
Type ..... Monocoque
Material ..... ABS resin plastic

DRIVE TRAIN:
Type (prim./sec.) ..... Spur gear/shaft
Differential ..... Bevel gear

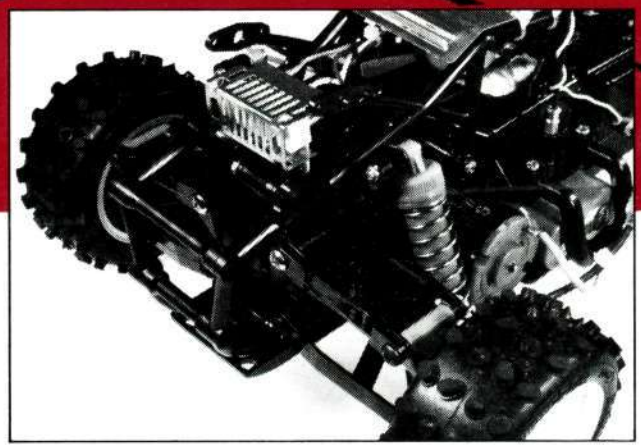
SUSPENSION:
Type (f/r) ..... Double wishbone
Dampening (f/r) ..... Oil/Oil

TIRES:
Front: Type ..... Block oval/Spike
Dimensions ..... 3¼x1½ inches
Rear: Type ..... Block oval/Spike
Dimensions ..... 3¼x1½ inches

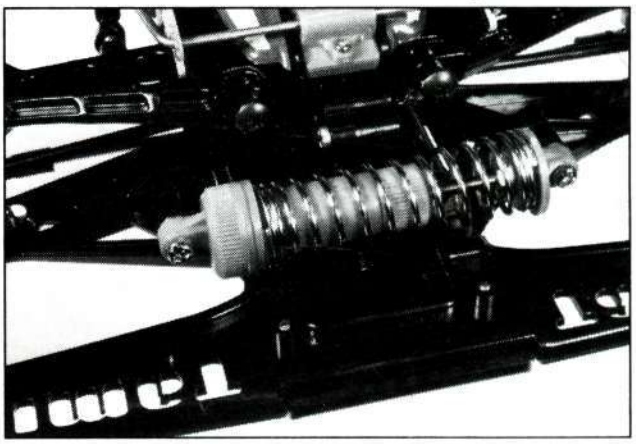
ELECTRICAL:
Motor RS-540S
Speed Controller ..... Three-step
Bearing Type ..... Plastic
Battery Type Req. ..... 6-cell flat

OPTIONS AS TESTED:
None

COMMENTS:
The Super Sabre offers very good dollar value, and is surprisingly quick for a car with a standard 540S motor. Front anti-roll bar seems to work better than it does on the Boomerang. Needs a better rear bumper to protect "the vitals" at that end during an accident.



Left: *The suspension on the Super Sabre is identical to that of the Hot Shot II pictured here. Note oil-filled coil-over shocks and upper and lower suspension.*
Below: *The front suspension uses a horizontal mono shock to absorb the bumps.*



"10 Best" in the 4WD Entry-Level Class (July '88). The mainstay of the car's construction is its tough, one-piece, ABS bathtub chassis. Attached to both ends of the chassis tub are two sealed gearboxes that incorporate MRC's differential gear assemblies. These are connected directly to each other by a solid tempered-steel drive shaft, both front and rear. The suspension system consists of front and rear independent double-wishbone arms that are directly controlled by three adjustable coil-over oil-filled damper shocks (two rear and one front monoshock) to enhance the Sabre's tight-cornering ability. The front suspension system includes a totally adjustable anti-roll bar that's easily accessible for quick pit-stop adjustment. The kit includes one-piece, lightweight racing mags that are matched to rear pin-and-block treads and narrower front tires of the same type, a high-performance stock 540S motor and a three-step forward-and-reverse speed controller. The Sabre's new aerodynamic polycarbonate body is shaped to slice through any wind resistance it may encounter.

CONSTRUCTION: Construction took about eight hours. To facilitate assembly, you'll need some tools that aren't included, i.e., a Phillip's screwdriver and a flat-head screwdriver, a needle-nose pliers, a hobby knife and some good glue. In keeping with Tamiya's high standards, the very detailed instruction manual includes scale diagrams of construction and parts, helpful notes, performance tips and a popular troubleshooting/operation guide that makes life easier for those who have frequent panic attacks. After first separating the parts in an orderly fashion, begin assembly by installing the radio gear. The kit doesn't include a radio, so I chose a Futaba* Magnum.

The Sabre includes an assortment of servo horns to fit any popular servo, and it also provides all the necessary hardware for properly installing servos of various sizes. Test the radio system and install the battery-eliminator circuitry (BEC), then prepare the steering and throttle servos.

Most of the assembly steps are straightforward, so I'll only discuss a few. When radio prep has been completed, move on to the assembly of the differential (diff) systems. As I've mentioned in previous track reports, before you start assembling your model, you should consider buying a complete ball-bearing kit to replace the plastic bearings included in the kit. You'll not only noticeably improve your car's performance, but you'll also reduce friction and premature wear and tear on the moving parts.

While assembling the diff systems, use an abundant amount of diff lube on all the enclosed gears; this will supply endless

(Continued on page 126)

ACTION WEEKEND

(Continued from page 50)

with Kevin Perry to try once more to capture the Championship.

Since this is the most prestigious race of the year, all the top teams will be competing. There's a strong possibility that Gene Hustings of Associated* will introduce his new 1/10-scale on-road race car, and there's also a good chance that Jerry Landgraft will exhibit his new 1/10-scale oval car. Many manufacturers will also be on hand to show off the new 1/10-scale on-road products that are sweeping the nation.

Over 200 amateur drivers are expected to bid for the Stock and Modified Championships, including Guy Amy, Mike Ankney, David Timmerman, Howie Ursaner, Jimbo Evans, Joe Gish and Paul Borowski.

The top 20 invitational drivers and the top 20 amateur drivers will all have the chance to vie for the gold rings in the two-minute Acutrak Dash.

Who do *you* think will win the Invitational Championship? Will Buddy Bartos be able to regain the momentum he once had, or is he over the hill? Or will Joel Johnson, who holds 13 1/12-scale national titles, win his first superspeedway victory? What about Trinity, Twister, Reedy, Peak Performance, Checkpoint—or even some unknown?

I don't know the answer, but with the team drivers running three 100-lap qualifiers, I guarantee this will be one of the finest R/C racing events ever held.

Next month, I'll interview the car manufacturers and once again get behind the scenes. Until then, keep the fun in racing!

**Here are the addresses of the companies mentioned in this article:*

CAM Racing Motors, Rt. 3, Box 680, Huntersville, NC 28078.

Composite Craft, 2400 Sand Lake Rd., Orlando, FL 32809.

TRC, P.O. Box 478, Oakboro, NC 28129.

Trinity, 1901 E. Linden Ave., #20, Linden, NJ 07036.

Peak Performance, 150 Los Obreros Lane, Suite G, San Clemente, CA 92672.

Reedy Co., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Twister Motors, 657 E. Arrow Hwy., Suite H, Glendora, CA 91740.

BoLINK R/C Cars, 420 Hosea Rd., Lawrenceville, GA 30245.

Lazer Lite Systems, 2090 SW 71 Ter., Unit H8, Davie, FL 33317.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626. ■

BUDGET RACER

(Continued from page 47)

age is low. Your car might run away from you!

The kits came with Tamiya-type connectors, and installation in a variety of cars looked easy. The installation instructions include those for an RC 10, Frog, Grasshopper, Cox Scorpion, Kyosho and Hirobo, and I'm sure these kits can be made to fit other cars as well.

Was there anything I didn't like? Yes: The Parma microswitch takes a while to set up. BoLINK's microswitch is a simpler, more foolproof design. (See the photos.) On the other hand, Parma's microswitch looked considerably more beefy than BoLINK's. Only use—and time—will tell! Incidentally, save your wiring diagram, so that if you cook a microswitch, you can wire around it. The factory diagrams show how to do this.

Like the other parts of your car, speed controllers require regular maintenance. Keep them clean; keep the tension correct; check the connections frequently. If you're interested in a smooth application of power, controlled braking and reverse when you want it, try these wire-wound speed controllers from BoLINK and Parma. You won't be disappointed.

See you at the track.

**Here are the addresses of the companies featured in this article:*

Parma International, Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245. ■

by JOE BRUNI

HOW TO USE LIQUID MASK

IN MY ATTEMPT to create the most exotic paint designs on all my R/C bodies, I've spent hundreds of dollars and hours (and destroyed several R/C bodies!) searching for that quintessential painting technique. Just when I was about to give up and settle for the old, conventional, time-consuming masking-tape routine, I found liquid masking film. I'm amazed at the versatility of this product and how easy it is to use. Of the several available brands of Liquid Mask, I chose Parma's*, because of its superior covering quality, and easy removal and application.

The mask is a non-toxic, water-soluble, viscous, blue-green liquid. It quickly dries as a flexible, totally transparent, blue-tinted film that conforms closely to a car's chassis. Most R/C car bodies are made of Lexan, and the mask can be applied to the undersides. I've also tested the mask on ABS plastic and fiberglass bodies, and I've had exceptionally good results. With versatile Liquid Mask, there's no limit to the possible paint schemes you can create on your favorite dream machine.

Before applying the mask, I perform the following preparatory ritual: At the kitchen sink, I scrub

MASKING TAPE GIVING YOU PROBLEMS? TRY THIS STUFF.

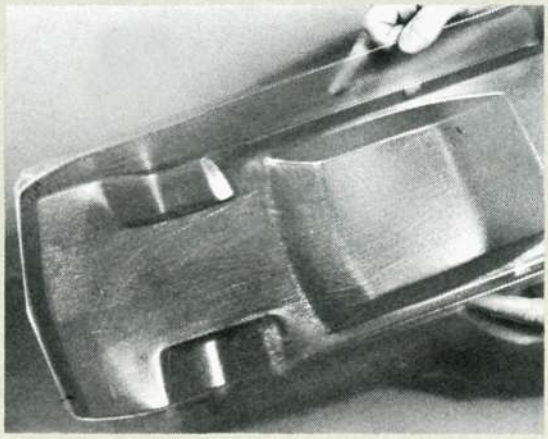
the underside of the body thoroughly, using a mild detergent to remove dust and oils. When the body is dry, I apply the first of three coats of Liquid Mask.

There are two methods of applying the mask: using an air brush or a bristle brush. I use a complete Badger Air Brush System for applying mask and paint. It's important to mix the mask with water in a 3-1 ratio (full-strength mask to water) to ensure an even spraying without clogging the air gun. If you use a bristle brush, apply the mask undiluted.

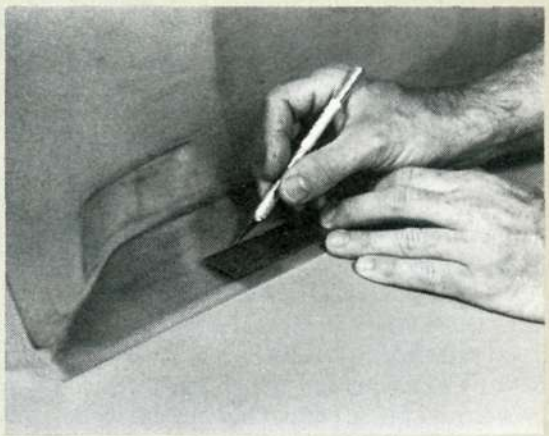
It takes approximately five hours for each coat of mask to dry thoroughly. You must apply it thickly to provide the Lexan with a protective barrier against the many coats of harsh paint that will be applied. It's also important to apply a thick coat so that when you cut out the designated areas, you won't etch too deeply into the Lexan and weaken the body. Always use a new X-Acto blade for each project, because having

The tools you'll need: an air brush (Badger No. 180-11) or a bristle brush, a straightedge, a new razor and, of course, Liquid Mask. (Parma's was used for this article.)

After a thorough washing with mild detergent and then drying, three coats of mask were sprayed on.

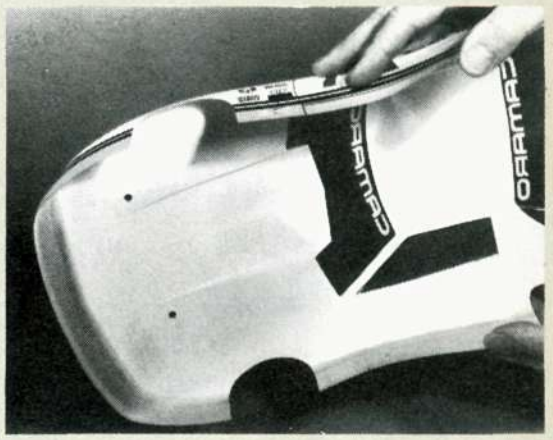


Here, the Liquid Mask was brushed on. Allow 24 hours to dry before you cut and spray paint on.



Cut out the pattern for the first color. Draw pencil guidelines on the inside or outside. It's transparent!

After pattern has been cut, start at a corner and peel mask back from area to be sprayed.

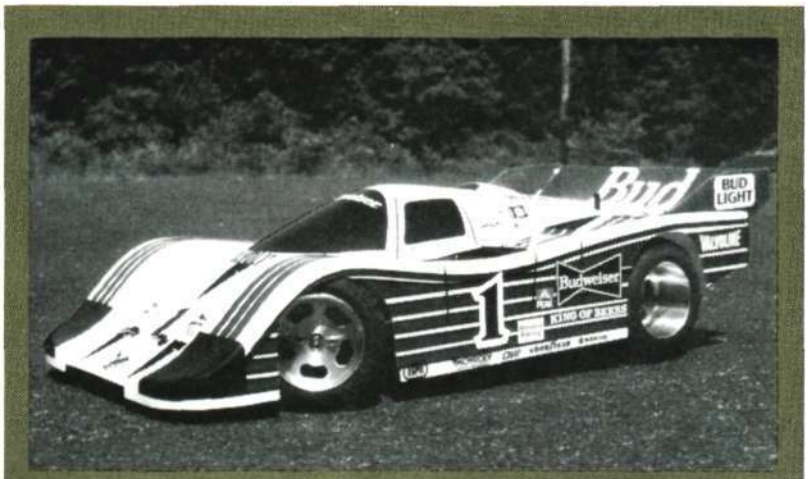


Mask is under paint base coat at rocker panels and front-bumper area. When first color dries, mask will be peeled off and the area then painted.

a blade that's just slightly dull will result in an uneven or jagged cut.

To increase my versatility with Liquid Mask, I've put together an inexpensive painter's tool kit. I have an array of triangles, stencils (squares, circles, stars), straight strips and curved shapes. These can be cut from cardboard or acetate or bought at your local art store. A good-quality knife is vital; I prefer an X-Acto with a generous supply of No. 11 blades. I also have permanent and water-soluble black pens of various tip sizes, which I use for door, hood, window and body-line accenting.

When I've applied the final coat of Liquid Mask and allowed the mask to dry thoroughly, I begin by sketching a design with a water-soluble black pen. This may be drawn either on the outside of the body or directly onto the Liquid Mask on the inside. If I make a mistake, I simply wipe off the error with a damp cloth and then draw a new design. When I'm satisfied with my sketch, I draw over the lines with a sharp X-Acto knife, using a straightedge or drawing freehandedly. On completion, just peel away the mask, leaving the Lexan exposed for paint application. If you decide against your initial design, reapply Liquid Mask over the area (three to four coats, of course) and start again.



This complex finish on the MRP Lamborghini C-4 is one more example of what can be done with Liquid Mask.

When painting Lexan, apply dark colors first. This avoids spraying dark colors onto light colors, and so altering the appearance of the light color. You may notice that the mask gets somewhat soft between coats of paint. This is due to the harsh base compositions of most popular Lexan paints, and it necessitates allowing each coat of paint to dry completely before attempting to etch the next design.

Let the body sit for two days before trimming the wheel wells and the excess Lexan. This interval gives the paint time to cure and bond to the Lexan. To trim straight lines, I use a long aluminum straightedge; for wheel wells I use the bottom of a drinking glass. Place the body on the edge of a piece of scrap wood and cut out the designated area. If I encounter an area that's difficult to trim, I use my Dremel rotary tool with a round sanding drum to complete the job.

The advantages of Liquid Mask are that, unlike masking tape, the edges of Liquid Mask are sharp, and don't allow the paint to run where it's not wanted. Another advantage is that the remainder of the mask (on the area that won't be painted) is protected against overspray.

There are several different body styles on the market today; my favorites are those designed by McAllister Racing*, Parma and BoLINK*, which all offer remarkable scale versions of full-size cars. There's also an enormous assortment of scale decal sets that add the finishing touch to your trick paint schemes. In an upcoming issue, I'll show you how easy it is to apply Liquid Mask to the *outside* of injected plastic bodies.

**Here are the addresses of the companies mentioned in this article:*

Parma International Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

McAllister Racing, 4545 Industrial St., Unit 5H, Simi Valley, CA 93063.

BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245. ■

ADVANCE

CUSTOM

STREET MACHINE

ADVANCE ENGINEERING'S NEW KIT A LA INDY

Almost any 1/10-scale body will fit the Advance Custom Street Machine. In this case, it's the BoLINK March '86 Indy body.

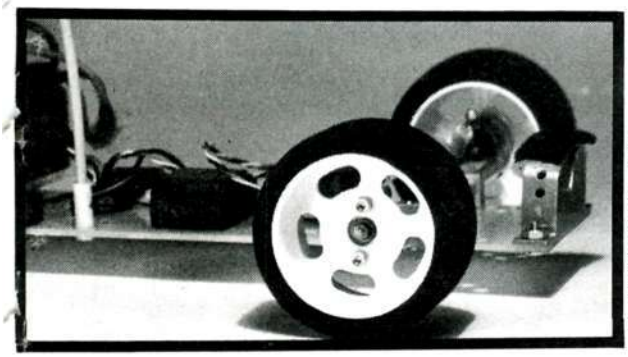
by TAI SUGAHARA

HAVE YOU EVER wanted to own an Indy car? Roger Penske owns several and every May, heads to Indianapolis to race in the Indy 500. With million-dollar sponsorships footing the bills, Penske has two or three cars available for each of his drivers. But you're not Roger Penske; all *you* want is one Indy car—right? Now Advance Engineering* makes Indy available to you. Their new Custom Street Machines are easily turned into Indy cars.

Included in the Custom Street Machine kit are a fiberglass chassis, front and rear axles, wheels, tires and universal body mounts. The front end is independently sprung and no body is included, so you can shop around for what you want. I used a BoLINK* 1/10 March 86-C Indy car body, a Futaba* Magnum Jr. radio system, a Futaba micro receiver and an MC9 electronic speed controller.

ASSEMBLY: All the Advance Custom Street Machines can be built in one evening, and the Indy version is no exception. The chassis plate has several holes for mounting the front axle, making it easy to fit different bodies to the car.

The kit bushings fit tightly into the rear axle blocks. However, a larger hole can be made with a sharp hobby knife. Very little material has to be scraped away, and no scraping is needed if you use ball bearings. Ball bearings aren't really necessary for a Street Machine that's used more on driveways than on race courses. But if you want more speed (and who doesn't?), bearings are the way to go.



Five-slot nylon wheels are standard on the Custom Street Machine. Aluminum ones are available, but the nylons have a weight and price advantage.

Painting the body is the most

ADVANCE ENGINEERING

CUSTOM STREET MACHINE

Type ..... On-road
Scale 1/10

DIMENSIONS:
Overall Length ..... 17½ inches
Width ..... 10⅛ inches
Height ..... 4½ inches
Wheelbase ..... 10⅛ inches
Front Track ..... 7 inches (adj.)
Rear Track ..... 8 inches (adj.)

WEIGHT:
Gross (w/rec. bat.) ... 2 pounds, 12 ounces

BODY:
Type ..... Indy March-86 (BoLINK)
Material ..... Lexan

CHASSIS:
Type ..... Single plane
Material ..... Fiberglass

DRIVE TRAIN:
Type (prim./sec.) ..... Spur and pinion
Differential(s) ..... None

SUSPENSION:
Front: Type ..... Coil spring
Dampening ..... None
Rear: Type ..... None
Dampening ..... None

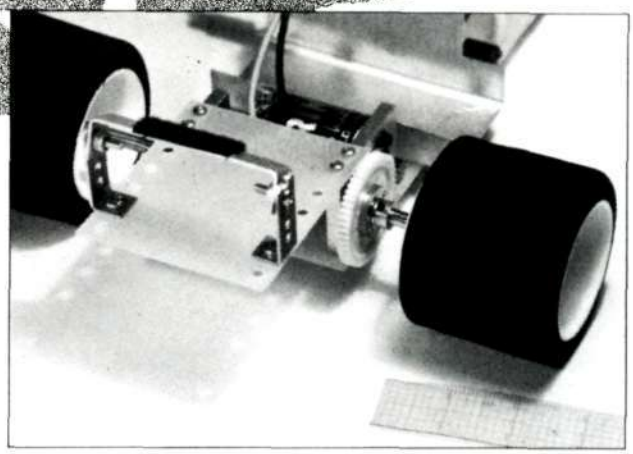
WHEELS:
Front: Type ..... Nylon
Dimensions (DxW) .. 2⅛x1¼ inches
Rear: Type ..... Nylon
Dimensions (DxW) ... 2⅛x2½ inches

TIRES:
Front ..... Foam
Rear ..... Foam

ELECTRICAL:
Motor ..... None
Battery Required .... 7.2V flat or hump-back
Speed Controller ..... None

OPTIONS AS TESTED:
Trinity quad-wind on-road—MC-9 Futaba speed controller.

COMMENTS:
A fun car that is inexpensive and easy to build. Surprisingly, the lack of differential wasn't really missed. Great acceleration off the line.



The rear body mount is cut to fit the rear wing on the BoLINK March. The rear tires are 2½-inch-wide foam slicks.

difficult task. You'll need good color photographs to paint a replica of your favorite CART driver. Obviously, the more details you include, the longer the job will take. Or, choose your own paint scheme; after all, you *are* the owner.

After painting, the next step is mounting the body to the chassis. If you were planning to race the car, you'd now have to drill holes all over your freshly painted body. But for show and street purposes, all that's necessary is one hole for the antenna. The unique Advance body-mounting system uses Velcro to attach the body to the chassis, leaving a much cleaner exterior.

My kit came with very light nylon wheels and foam tires. For that classic look, aluminum wheels and Grand Prix tires are also available from Advance Engineering. I cut my foam tires down to make the Indy car look more realistic. The 8-inch-wide rear axle lets you set the rear track at just about any width. This is also true for the front track, as there are a number of holes drilled for mounting the steering blocks. For the March body, I moved both rear tires out as far as they would go, so that the body would fit between them.

The front axle features adjustable caster. For the Advance drag cars, it's suggested the caster be set for 30 degrees. That would also work on the Street Machine, but the steering would be relatively slow. A better setting would probably be 10 to 15 degrees; this would make the car turn more quickly.

The spur gear is screwed onto a special hub. Unfortunately, no differential is used, although one is available as an option.

PERFORMANCE: Two areas of performance will be discussed: one is on-road and the other is "static" (a contradiction in terms, but I'll explain in a moment).

With the caster set at 15 degrees, the Street Machine has good straight-line stability, but it can still dive quickly into turns. The solid rear axle tends to induce understeer, making the car easy to drive at speed.

With the Trinity* Quad wind motor installed, the car has great acceleration and more top end than can be used on any driveway. To really enjoy driving your Street Machine, look for a suitable parking lot.

If you don't run into anything, Velcro holds the body on well enough for solo runs. However, if you start running two or more street machines side-by-side, you may have to switch to standard body posts.

The Indy car body isn't as fast as a closed wheel body; the exposed tires create a great deal of drag. But, you can't beat the look of an Indy car.

And that brings us to static "performance" of the Advance Custom Street Machine. This car is designed to be on display between runs. The Velcro body mounts leave the body intact, with nothing poking through the surface of your clean machine! None of your fancy paint job or lettering will have an ugly post hole in it. With aluminum wheels and GP tires, most car bodies will look even better, but please, don't use treaded tires on an Indy car; get the GP slicks.

The Advance Street Machine is one of the most versatile kits around. With over 40 1/10-scale bodies to choose from, there will be at least one that you want. For me, the Parma* Cobra is a favorite, or the '55 Chevy from BoLINK. (My first full-size

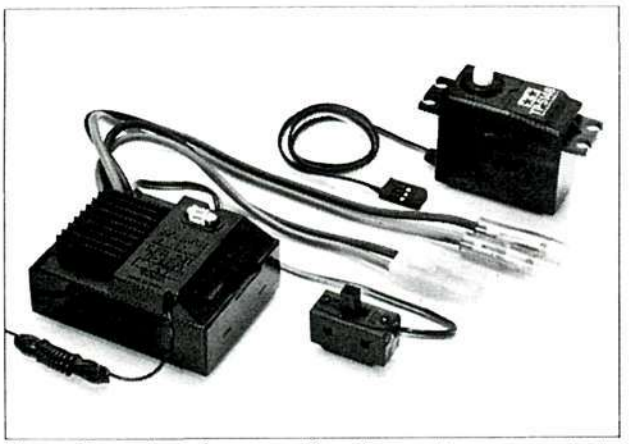
(Continued on page 99)

SCOPING OUT

BY RUDY MEYER

The ADSPEC C.P.R. Unit Saves Time and Space

SCOPING OUT: As we're committed to bringing you the most up-to-date technical information on R/C products, Radio Control Car Action *now has Rudy Meyer, an accomplished electrical engineer, to test the newest high-tech electronic equipment that's flooding the R/C market. "Scoping Out" is a two-part test in which a product is first subjected to extensive bench testing using sophisticated equipment and then actually used in the field. These tests will allow us to expose any ridiculous performance claims and, at the same time, provide R/C car enthusiasts with invaluable information on where they should put their money!*



The entire on-board system. Plug the steering servo and the motor into the C.P.R., and the C.P.R. into your 7.2V pack. No soldering.

IN EXACTLY THE SAME WAY as one expects crystal-clear reception when listening to the radio, talking on the telephone or watching one's favorite television show, the R/C car owner expects clear transmission between his car and his radio. This month, I focus on the Tamiya* ADSPEC Two-Channel Radio-Control System.

The ADSPEC is a two-channel R/C system that was designed for 1/12-scale models, but can also be used for 1/10-scale models. It's ideal for 1/12 scale, because the receiver and the electronic speed control are an integral unit that fits in the limited space available in a 1/12-scale model. The transmitter is a wheel-and-trigger pistol-grip type that includes a 1/100-second digital lap timer (located in the steering wheel), servo-reversing switches, speed control and steering rims, steering-rate adjustment, interchangeable channel crystals and an adjustable grip.

All transmitters have servo-reverse switching and both steering and speed trim, but all transmitters don't have steering-rate adjustment—ADSPEC does. What does this mean to the R/C racer? With ADSPEC you can now adjust the operating range of the steering servo from 15 to 45 degrees, for both left and right turns, to suit the course on which you're racing. This eliminates oversteering and understeering during the tension of the race.

The transmitter has an operating range of approximately 325 feet for surface operation, and it operates at 12 volts with a current consumption of 150 milliamps. The transmitter is nicely balanced to eliminate wrist/arm fatigue, and this really helps during a long race.

The receiver, which is called the C.P.R. unit (Control Processing Receiver), also incorporates the electronic speed control in the same package, so it saves space, which is at a premium in 1/12-scale models. There's no need to add receiver batteries, as this receiver gets its power from the motor battery. The C.P.R. unit comes from Tamiya with the battery and the motor connectors already attached. This removes the danger of destroying the unit by crossing wires, but it only allows you to operate your model with the 7.2V or 8.4V batteries. This limits you, because in certain race situations, e.g., drag racing, you might want to use a higher-voltage battery, but you won't be able to, because of the 8.4V limitation of the C.P.R. unit.

The tests I perform on electronic speed controllers are standardized at 6 volts and 12amps, and this controller, operating under these conditions, had .25 volts dropped across it. If you were operating with a 7.2V battery in your model, only 6.95 volts would reach your motor. Compared with speed controllers *without* built-in receivers that have voltage drops of .1 volts, this had twice the amount of voltage dropped across the unit, and this will result in a model that runs more slowly. This controller has one advantage over the others: It has a reverse mode. Unfortunately, if you want to enter a sanctioned race, this feature will disqualify you from using the unit.

Mount the C.P.R. unit where plenty of air can pass over it, because it has a built-in circuit protector that monitors

(Continued on page 91)

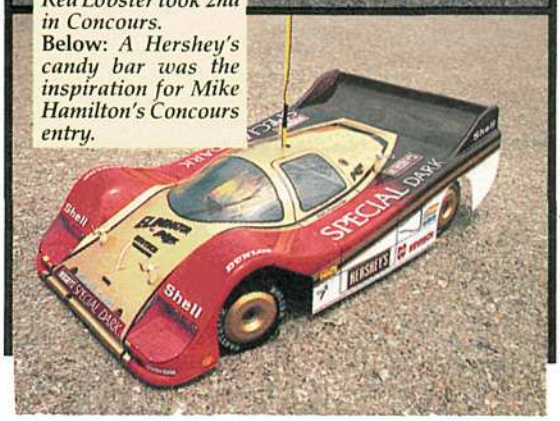
TULSA ONE-TENTH ON-ROAD NATIONALS

by RICH HEMSTREET

Bob Light chicanes his way to first place with a Trinity-powered Lynx.

Brad Potter's New Man Porsche won a close Concours event.

Racing in a parking lot during a drought is a hot proposition.

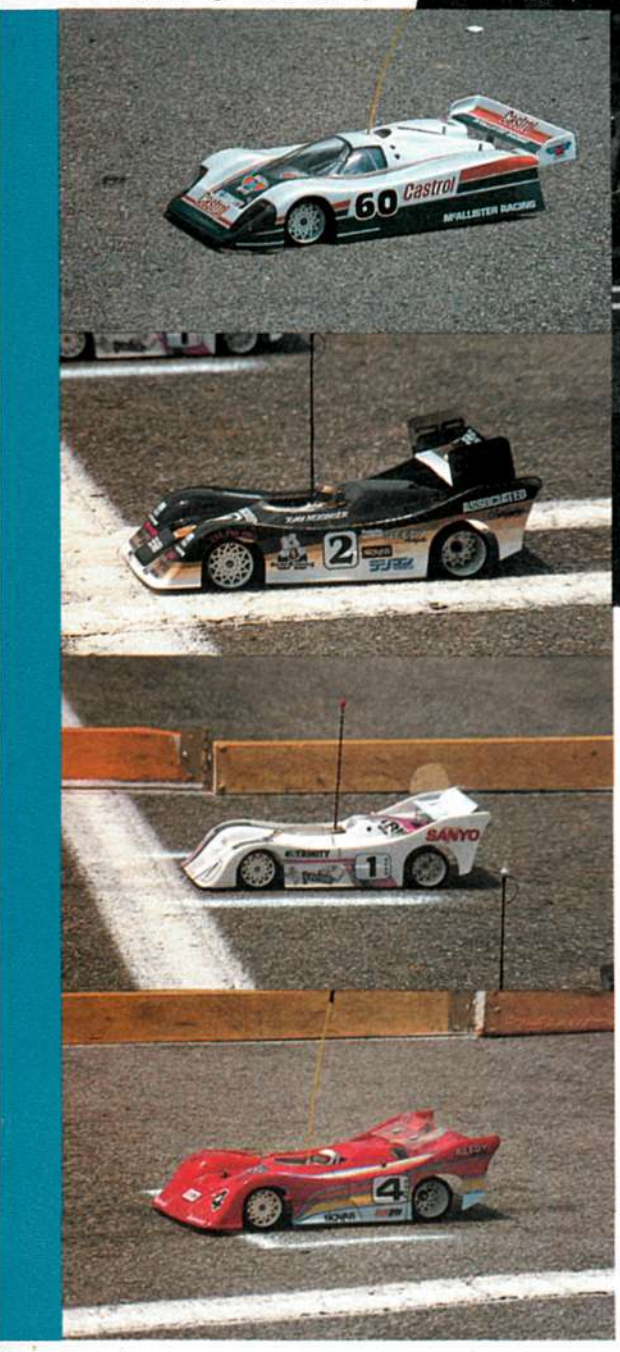


Above: *Bill Morton's Red Lobster took 2nd in Concours.*
Below: *A Hershey's candy bar was the inspiration for Mike Hamilton's Concours entry.*

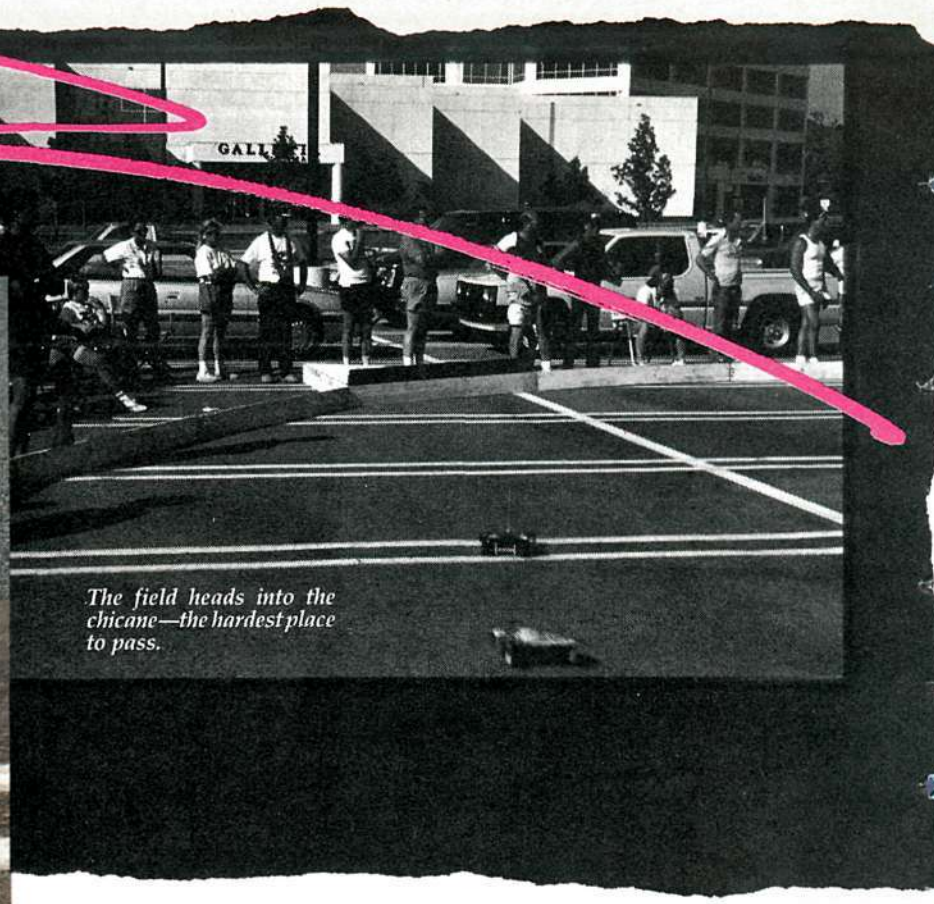
Photos by Rich Hemstreet.

SPONSORED BY Composite Craft*, the first 1/10-Scale On-Road Nationals was recently held in Tulsa, OK. The parking lot of the Kensington Sheraton Hotel took on an unaccustomed look as the track was laid out and a large tent for the racers to pit under was erected. Without the tent, conditions would have been unbearable, and with temperatures in the mid-90s and a drought in progress, it promised to be a long weekend.

TULSA NATIONALS



From Top: ***The McAllister Jaguar body was one of the best-handling GT bodies at the Nationals. Tony Neisinger almost won the National Championship with this Associated prototype. Joel Johnson's Lynx finished 4th in the A-Main. The Parma Pro Panther 10, with Andy Dobson at the transmitter, was very competitive.***



The field heads into the chicane—the hardest place to pass.

Despite the apparent lack of basic organization, the racers stayed calm and coped well with the many problems encountered. When the racing eventually started, everyone was feverishly preoccupied with the search for the right motor/gear/battery combination for the track, which was much smaller than the one shown on the diagram that they'd received by mail, because there was some concern about possible radio problems.

Qualifying was divided into three rounds on Saturday afternoon and a fourth round on Sunday morning. Driving a new prototype 1/10-scale Associated* car, Tony Neisinger gave everybody a target to shoot for when he turned 18 laps in his first four-minute qualifier. None of the other Modified drivers ever equalled that mark, but Neisinger himself came close with a 17-lap four-minute run. Bob Light, driving the new Composite Craft Lynx, was second fastest, and Andy Dobson was third fastest with his Parma* Pro Panther 10. In fourth spot was Ralph Burch, Jr., driving a new Hyperdrive 10, and Chris Doseck and his BoLINK* Eliminator 10 rounded out the top five.

Thirteen-year-old Frosty St. Clair, driving a TRC* Pro 10, was the Stock-Class TQ. Steve Stifel drove a VicFor Concept One to the second-fastest qualifying time, and third-fastest on the grid was Jim Rose with a Delta Villain. Don Cooper drove a Hyperdrive 10 to the fourth qualifying slot, and Wade Pruetz was fifth, driving his TRC Pro 10.

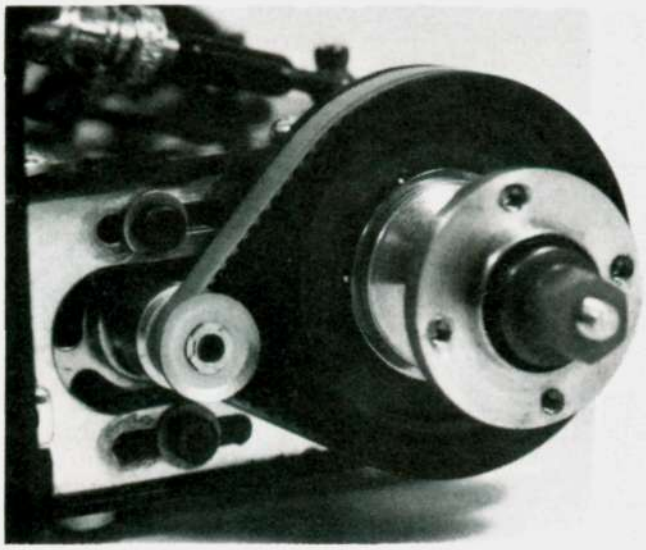
Many drivers were dissatisfied with the track, because although the traction was good, the interior boards presented a problem. There were no dots (plow discs) on the slow turns, so every time a driver cut a corner a little too close, there was heavy contact with a solid board. Also, the course changed several times, partly because the cars pushed the boards out of place. The chicane in the center of the track was tightened up after practice, so was fine for the first three rounds of qualifying, but by Sunday, it wasn't quite as tight. These problems really shouldn't happen at a national event.

While the Mains were being set up, the Concours judging took

(Continued on page 80)

HYPERDRIVE

Belt-Drive Goes On-Road



TULSA saw the introduction of two products that have noise levels at either end of the scale. On the one hand, the Hyperdrive from S.S. Industries was unusually quiet, while on the other, the Composite Craft gas-pan car was a real ear-blaster.

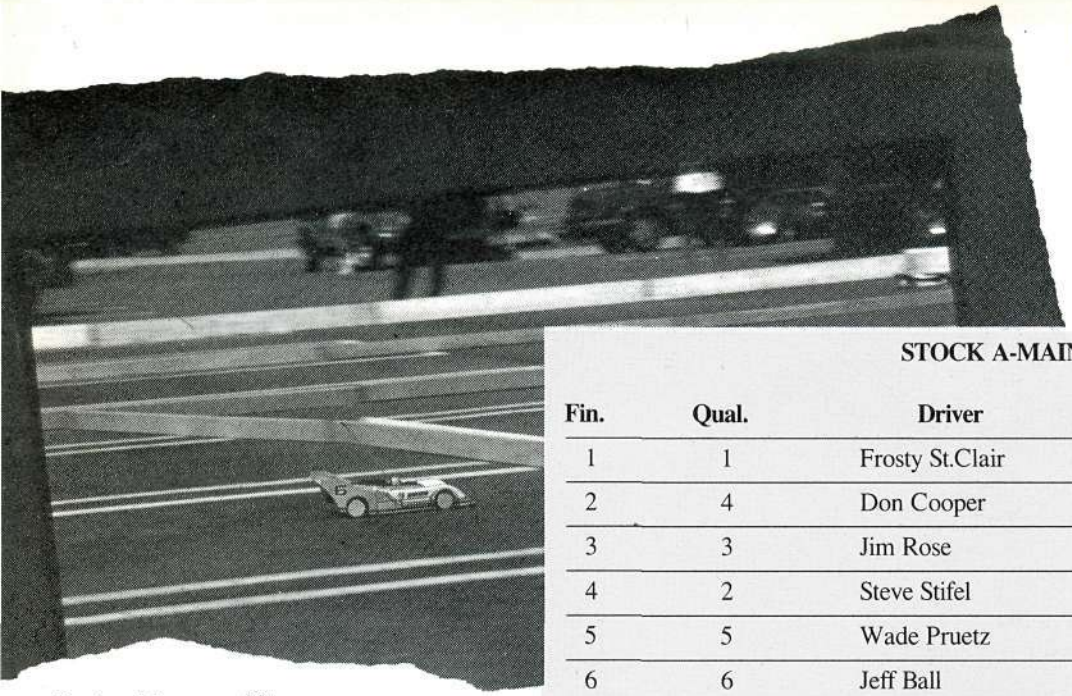
The Hyperdrive is a pulley-and-belt system that replaces the pinion gears and spur gears; the axle pulley has the holes for the ball differentials. To install the system, you first have to be able to switch the motor from the right to the left side of the pod, because the two pulleys travel in the same direction, while the pinion gears and spur gears turn in opposite directions. Second, there has to be enough adjustability in the motor pod so that the two pulleys can move apart from each other. If they can't, the belts won't have enough tension to stay on. Belts are available in several sizes, but you should be able to adjust them as much as possible.

Cars using the Hyperdrive system run almost silently; the sound of the body bouncing and the tires scuffing on the track is more audible than the motor and belts. I don't know how closely noise is related to friction, but when regular gears have problems, they usually make more noise. Either the gears start binding, or they start slipping further apart and aren't meshing properly. The finer the pitch, the more touchy the gear mesh is. This new belt-drive system didn't seem to have any problems with slipping, even when looser than it should be. I saw a belt that had 75 runs on it; there was some wear, but it still appeared to have a lot of life in it.

How successful was the Hyperdrive? Any driver who was interested was given the chance to use this system at the Nationals. The representatives from S.S. Industries answered everyone's questions; they didn't just cater to the "hotshots." A total of 15 drivers of varying levels of ability tried the belts and pulleys; these 15 drivers ended up in nine different Mains. Five of those Mains were won by belt-driven cars, and two others took second and fourth places in the Stock A-Main.

The comparative quietness of the Hyperdrive was in marked contrast to the noise that came from the new Composite Craft 1/10-scale gas-pan car. This car uses a .15 2-stroke motor, 32-pitch gears, and 1/10-scale tires and front-end pieces. Composite Craft's Jeff Davis is doing the development work on the car, and he and Butch Kloeber each ran a number of laps on the track. In the tight chicane, the electrics were quicker, but on the long straight, this car really flew! The car still needs work, but problems will probably be worked out soon. Orders are already coming in for this, the latest in R/C racing. By the way, BoLINK, too, has had a gas car in the works for two years. ■

TULSA NATIONALS



STOCK A-MAIN

Fin.	Qual.	Driver	Chassis
1	1	Frosty St.Clair	TRC Pro 10
2	4	Don Cooper	Hyperdrive 10
3	3	Jim Rose	Delta Villain
4	2	Steve Stifel	VicFor Concept One
5	5	Wade Pruetz	TRC Pro 10
6	6	Jeff Ball	BoLINK Eliminator 10
7	7	Barry Raborn	BRP 10
8	10	Mark Johnston	BoLINK Eliminator 10
9	8	Eric Meyers	Composite Craft Lynx
10	9	Steve Rule	BoLINK Eliminator 10

MODIFIED A-MAIN

Fin.	Qual.	Driver	Chassis	Motor
1	2	Bob Light	Composite Craft Lynx	Trinity
2	1	Tony Neisinger	Associated Prototype	Reedy
3	5	Chris Doseck	BoLINK Eliminator 10	CAM
4	8	Joel Johnson	Composite Craft Lynx	Trinity
5	9	Mark Blackketter	TRC Pro 10	Trinity
6	6	Bud Bartos	BoLINK Eliminator 10	CAM
7	10	Art Carbonell	VicFor Concept One	Reedy
8	3	Andy Dobson	Parma Pro Panther 10	Parma
9	4	Ralph Burch, Jr.	Hyperdrive 10	Reedy
10	7	Butch Kloeber	VicFor Concept One	Reedy

(Continued from page 78)

place. Owing to the officials' ruling that the top three Concours winners had to run their bodies in the Mains, of the 30 cars entered, only half showed up. While most of the drivers were willing to run their cars in a heat race, they didn't want to be penalized by switching body styles in the Main. Brad Potter won Concours with his replica of the New Man Porsche; Bill Morton took second place with a copy of the Red Lobster GTP car; and Mike Hamilton's Hershey's Special Dark GTP racer came in third.

When the Mains had been posted, many racers started to search for radio equipment. Several Mains had seven or more drivers running on the 27MHz radio band, and since only the top six could run on these frequencies, everyone else had to switch to 75MHz.

Frosty St. Clair repeated his success in Stock Class by winning the A-Main, and so became the 1988 National Champion. Don Cooper moved up from fourth to second, while Jim Rose held on to third place.

Many top drivers competed in the Modified A-Main, including Bud Bartos (6th position), Butch Kloeber (7th), and Joel Johnson (8th). Former World Champ, Art Carbonell, was the tenth-fastest qualifier.

Neisinger jumped in front at the start, with Light on his tail. Dobson and Burch tried to stay close, but bobbles through the chicane caused them to drop off the pace. Neisinger and Light put on quite a show, with Neisinger blocking the challenger's every move. On the last lap, just coming out of the chicane, Neisinger's car slowed down; Light bumped past him on the inside and went on to win the 1988 1/10-Scale On-Road Modified National Championship. Neisinger held on for second place, and Doseck came in third.

With the trophy presentation, the long, hot weekend drew to a close. In all fairness, it was a first attempt, but more thorough groundwork definitely needs to be done to get the Nationals running smoothly. Two new National Champions were recognized in a brand-new scale: 1/10-Scale On-Road. Congratulations to Frosty St. Clair and Bob Light!

**Here are the addresses of the companies mentioned in this article:*

Composite Craft, 2400 Sand Lake Rd., Orlando, FL 32809.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626.

Parma International Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

BoLINK R/C Cars, 420 Hosea Rd., Lawrenceville, GA 30245.

TRC, P.O. Box 478, Oakboro, NC 28129. ■

TAMIYA

FORMULA 1 CARS

by CHRIS CHIANELLI

Photo Credit: STEVE POND

Left and Below: *These paint schemes, a la "King Ura," aren't styled after any particular full-scale F 1 or Indy car, but look as if they are. If you choose the scheme of your favorite Indy or F 1 team, it will look true to scale on these bodies.*

I CAN'T EVER RECALL somebody telling me they don't like Formula 1 cars, although I'm sure those people are out there. With their open wheels, wings and bright paint schemes, Formula 1 cars turn most people on to some degree. There's just something special about Formula 1 racing—even the women in the winners' circle at the Grand Prix are the classiest.

MRC/Tamiya* has now introduced two 1/10-scale F 1 cars: the Williams FW-11B Honda and the Lotus Honda 99T. Both have the same chassis, and it's almost identical to the well-known, and much-liked Road Wizard. The only differences I can think of is that the Wizard comes with a small mechanical speed controller and has a small aluminum oil-filled shock. These new cars have no speed control; the instructions only show installation of electric types; and the shock is the larger-volume, plastic shock, which is typical of Tamiya. By the way, this shock seems to work very well on these cars, and it comes with three shock pistons for soft, medium and hard dampening. Tamiya somehow manages to get a 30-step instruction booklet out of this kit. I say this only because these cars are *very* easy to build and have a low parts count and a good all-around fit. It's quite evident that Tamiya doesn't believe in the possibility of overkill when it comes to instructions—a blessing, if you happen to be a beginner. For example, Step 9 shows you how to put the 7.2V battery strap in the upper radio plate; no stone is left unturned in *this* booklet! The chassis and the sub-chassis are of fiberglass, and the front

The finished car. It's ready to have the body clipped on and to hit the track.

Give These F-1s an Indy Paint Scheme, and Hit the High-Speed Oval

The Tamiya F 1 cars are very predictable in terms of handling and are fairly fast with a 540, because they're so light.

suspension and the gear-case assembly (except for the aluminum stay tube) are of plastic. The differential is a gear type that works smoothly, but I've heard rumors that somebody will soon offer a ball diff. If that's your preference, this car is definitely worth it. The kit comes with ball bearings for the rear axle, and a set of six, purchased separately, will take care of the front wheels and the differential.

The design of this Tamiya F 1 car is very similar to that of the 1/10-scale on-road cars like the ones running at the Lake Whippoorwill Speedway. The front coil springs (no dampening) and steering blocks are mounted on the end of very scale-looking plastic suspension components that mount to the fiberglass chassis, giving the car that full-scale F 1 look. At the rear end is the familiar T-bar with one oil-filled coil-over as previously stated. An adjustable chassis stay spans the chassis members, and rubber grommets are sandwiched between these two. By tightening or loosening the center screw, you stiffen or loosen the rear suspension thereby dialing-in understeer or oversteer.

In spite of its somewhat diminutive size, there's a fair amount of room for radio gear. However, things will go more easily if you use the smaller servos and speed controller. The red car has a Victor Vic 3A, made especially for 1/12-scale cars. Right now, you might be saying, "But these cars are 1/10-scale!" True, but just as the full-size Formula 1 cars are small, so are the models. In terms of track and wheelbase, the dimensions of these cars are less than those of 1/10-scale stock cars.

The airbrush work was done by Rich "King Ura" Uravitch, our Technical Editor, who chose not to paint the cars like the picture on the box. The important thing here is that to make your F 1 car an Indy car, all you need to do is change the paint.

The kit comes with 16- and 17-tooth pinions. Using the 17-tooth pinion, the supplied 540 pushed the car at quite a good rate, but this doesn't cause any surprise, considering that all-up weight with battery pack is a light 2 pounds, 2 ounces. For a really blinding performance, I can't see anyone using anything much hotter than a good stock wind; any high-speed oval motor might be a bit too much in this lightweight. With lightness comes enhanced duration; we had an honest 10 minutes running time with the 540. Although we only ran the cars on new blacktop, the sponge tires had just the right amount of traction for this surface. They'd let go and recover just when we expected them to. With these tires and the rear suspension adjusted soft, I found it difficult to get into trouble.

The car had a comfortable understeer and recovered from a power slide right on cue. Of course,

(Continued on page 88)

MRC/TAMIYA

LOTUS HONDA/ WILLIAMS HONDA

Type ..... Formula 1
Scale 1/10
Sug. Retail $147.99

DIMENSIONS:
Overall Length ..... 14 7/8 inches
Width ..... 7 1/2 inches
Height ..... 3 1/4 inches
Wheelbase ..... 9 7/8 inches
Front Track ..... 6 1/4 inches
Rear Track ..... 5 7/8 inches

WEIGHT:
Gross (w/rec. bat.) ..... 2 pounds, 2 ounces

BODY:
Type ..... F 1/Indy
Material ..... Lexan

CHASSIS:
Type ..... 3-point suspension
Material ..... Fiberglass

DRIVE TRAIN:
Type (prim./sec.) ..... Pinion and spur
Differential(s) ... Gear diff w/two planetaries

SUSPENSION:
Front: Type ..... Coil
Dampening ..... None
Rear: Type ..... T-bar
Dampening ..... One oil-filled

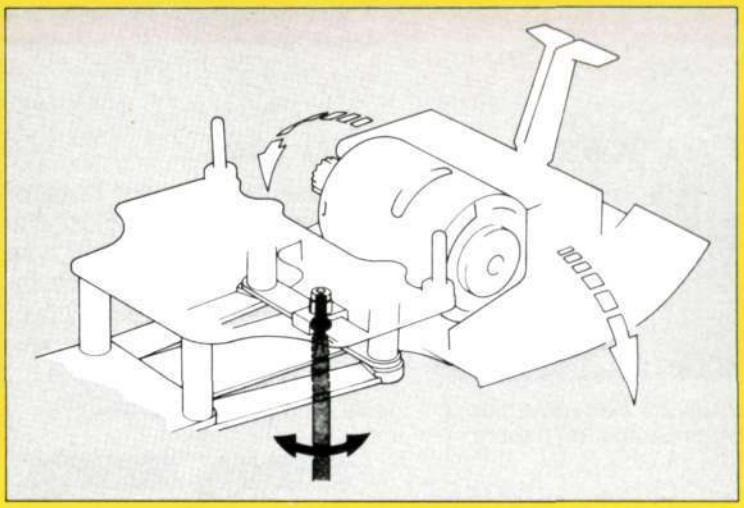
WHEELS:
Front: Type ..... Plastic
Dimen. (DxW) ..... 1 3/8x1 1/16 inches
Rear: Type ..... Plastic
Dimen. (DxW) ..... 1 3/8x1 9/16 inches

TIRES:
Front ..... Sponge
Rear ..... Sponge

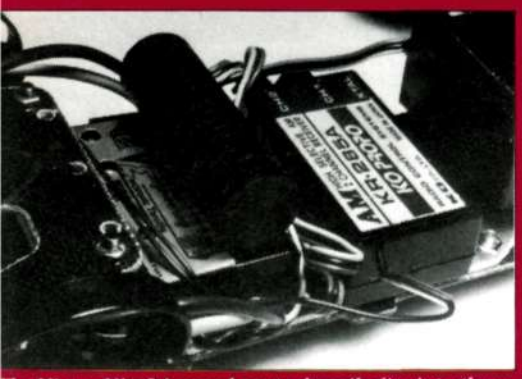
ELECTRICAL:
Motor 540
Battery Required ..... 7.2V flat
Speed Conroller ..... None

OPTIONS AS TESTED:
Victor Engineering, Vic-3A electronic speed controller, 1/12-scale.

COMMENTS:
An extremely docile car. Simple design and lightness give it huge potential in terms of speed and dependability under race conditions. Too bad there's no class for it yet.



Adjusting the center screw on the cross-stay lets you dial-in understeer or oversteer to suit your needs.



The Victor Vic-3A speed control easily fits into these somewhat small cars. It's reported that voltage drop on these units is very small.

The plastic wheels were sprayed silver for added flash. The Duratrax slick especially made for these cars looks more scale than the foam, but didn't work well on the blacktop where the testing was done.

The MRC ADSPEC radio's C.P.R. unit combines the receiver and the electronic speed control. This unit greatly simplifies radio installation by totally eliminating the need to solder.

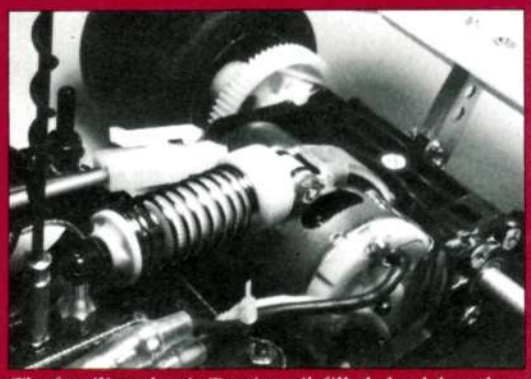
(Continued from page 85)

all this predictability suffers when you go to a hotter motor, but that's racing.

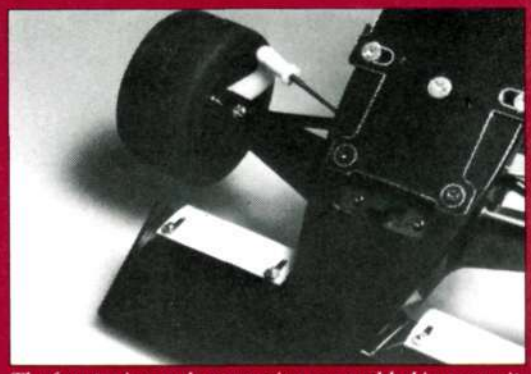
I know all I've said thus far sounds good, good, good, and it is—except for one thing: These models are true 1/10 scale. You might say, "Well, isn't that good, too?" The problem is, there's no class to race these cars in. If you take a 1/10-scale stock and try to put it on this chassis you'll find it won't quite fit. Racing, sanctioned or otherwise, doesn't matter to a lot of us, simply because we run our cars for our own enjoyment. If your club wants to start an F 1 or Indy series, this is *the* car. If 1/10-scale Formula or Indy racing ever does get its act together, this is the car to get the ball rolling, and it may be the car by which all others will be judged. Many think Formula 1 is the elite form of racing; I think its time has come in R/C. You certainly can't use lack of paint schemes as an excuse!

**Here is the address of the company mentioned in this article:*

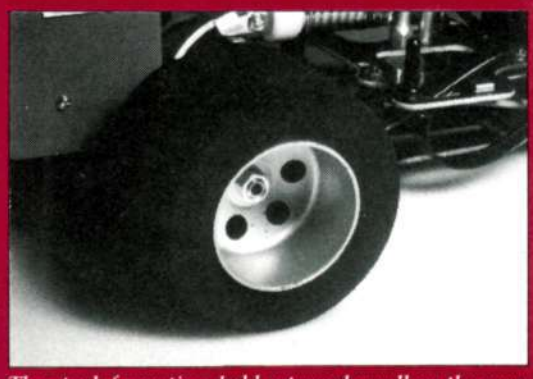
MRC/Tamiya, 2500 Woodbridge Ave., Edison, NJ 08817. ■



The familiar plastic Tamiya oil-filled shock has three pistons to choose from, for more or less dampening to fit your track conditions and driving style.



The front wing and suspension are molded in one unit. Note the adjustable spoilers for more or less downforce.



The stock foam tires held extremely well on the new test blacktop and exhibited just the right amount of "break." They also ran very true without having been trued on a machine.

SCOPING OUT

(Continued from page 74)

the temperature of the power FETs, and under high temperature conditions, it will cut off the current flow to the motor.

I found the following advantages in ADSPEC:

- Single package receiver and electronic speed controller.
- Variable-rate steering adjustment.
- Built-in lap counter.
- Fully connectorized to eliminate soldering.
- Ideally suited to 1/12-scale models.
- Reverse capability.

The major disadvantage is that the unit operates on the 27MHz band, which is for the CB. If a CB transmitter is close to your model, you may lose control. This transmitter/receiver combination should have been designed to operate on the model frequency of 75MHz to eliminate interference.

The ADSPEC is suitable for beginners because, with its connectorized harnessing, it's easily installed. Unfortunately, if you want to upgrade your model with a larger battery, you're limited to a maximum of 8.4 volts, but newcomers and racers of 1/12-scale cars will enjoy the advantages of Tamiya's ADSPEC.

**Here is the address of the manufacturer featured in this article:*

MRC/Tamiya Plastic Model Company, 2500 Woodbridge Ave., Edison, NJ 08817. ■

FORTUNE ON A FENDER

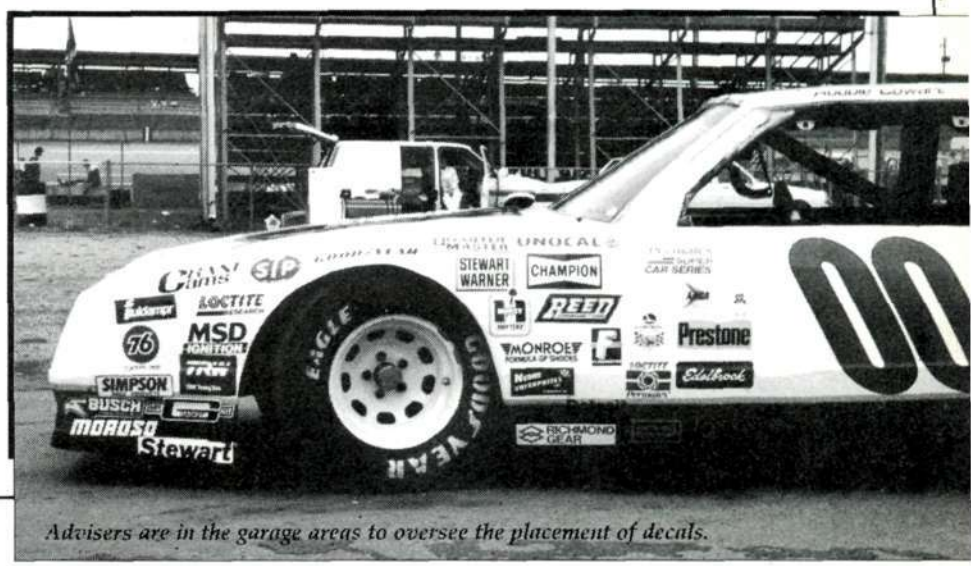
PRODUCT DECALS. MORE THAN DECORATION—A LOT MORE!

by ERIC GOLDSCHRAFE

TO ALL BUT THE MOST die-hard fan, the front end of a stock car is just covered with a bunch of stickers, but to the NASCAR teams, it's a "3.5 million-dollar fender." Every time a car races with specific decals in place it's worth contingency award money.

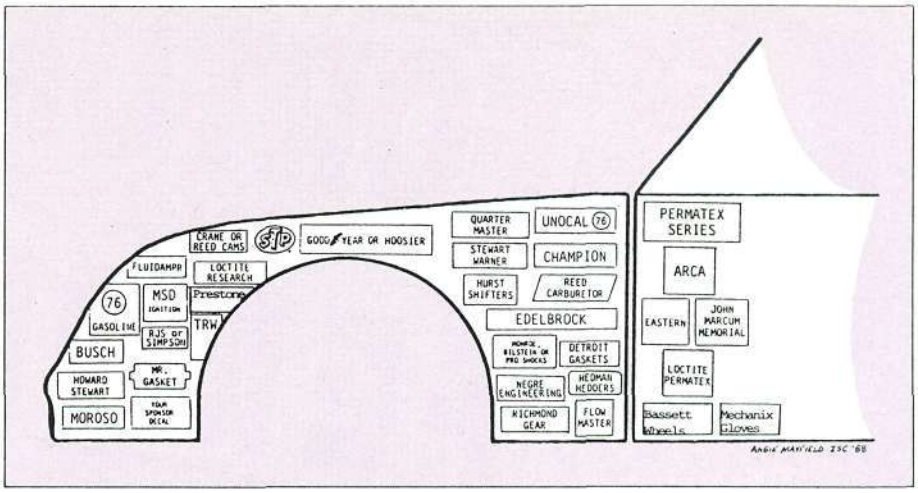
With about 40 companies participating, organization is essential so that representatives can verify that a certain decal was actually on a given car (or on every one of a 42-car field) during a race. Stock-car organizations have designated specific locations on every car for each product decal so that a given decal may be spotted immediately among the clutter. For the Winston Cup races and the Busch Grand National series, NASCAR has a printed diagram showing the correct locations for every decal. The ARCA Permatex Supercar series has its own diagram, and this is used for an entire season. Because correct placement is important, there are advisors in the garage areas to assist with decal positioning.

Note that this deals *only* with the front fenders; anything behind the car numbers on the doors is a paid sponsor deal, often worth millions. Knowing this, you can use diagrams or photos of real cars to get the realistic appearance of the big-time stockers on your model. Most of the decals are available on assorted Parma*, Autographics*, and McAllister* decal sheets. You might not find every one you need (I needed about six different sheets to get all but a couple needed for the No. 28 Havoline car that went to Talladega), but many are on Parma's No. 10606 NASCAR sheet, or McAllister's No. D-216 sheet, which also includes window net and grill material. If you intend to save a body for concours-type events, and



Advisers are in the garage areas to oversee the placement of decals.

FORTUNE ON A FENDER



1988 ARCA Permatex decal layout. **Only** *the decals shown are to appear on front fenders or doors at any time.*

can't locate a specific decal, leave the space blank for the time being; chances are that the one you need will be available shortly.

Most of the decals on real stockers butt right up against one another, and on the smaller cars, like the new Grand Prix, they may even overlap. Many of the decals available are somewhat oversize for 1/10 scale, and must be closely fitted to get them all in place. Some have borders that can be cut off, but others will probably have to overlap. Perhaps one of the manufacturers will take the cue and put all the right decals on one sheet, in the correct size. A few of the plastic kit makers do this already.

I thank John Fox and John Carolla of Loctite*/Permatex for their assistance.

**Here are the names and addresses of the companies mentioned in this article:*

Parma International, Inc., 13927 Progress Parkway, N. Royalton, OH, 44133.

Autographics of California, 1700 14th St., Bakersfield, CA, 93301.

McAllister Racing, 2205 First St., Unit 107, Simi Valley, CA 93065.

Loctite Corp., 18731 Cranwood Park, Cleveland, OH 44128. ■

STREET MACHINE

(Continued from page 72)

stock car was a '55 Chevy). And, of course, my own Indy car is a status symbol as well. Not many people, other than Roger Penske and me, own Indy cars. And I get to drive mine!

**Here are the addresses of the manufacturers mentioned in this article:*

Advance Engineering, 180 S. Hwy. 67 Unit G, P.O. Box 766, Woodland Park, CO 80866.

BoLINK R/C Cars, 420 Hosea Rd., Lawrenceville, GA 30245.

Futaba, 555 W. Victoria St., Compton, CA 90220.

Trinity, 1901 E. Linden Ave., Linden, NJ 07036.

Parma International, 13927 Progress Pkwy., North Royalton, OH 44133. ■

RC 10 TECH

(Continued from page 38)

we can't let it go untouched: Four of the ball links need to be shortened. Use an X-Acto knife and cut off ⅛ to ¼ inch of the tie-rod end of the ball link. When screwing the ball links onto the turnbuckles, remember that the sets of threads on the turnbuckles run in opposite directions. This allows a matching adjustment of both ball links, so *center* the turnbuckle. Also remember to cut the mounting

RC 10 TECH

screws flush with the top of the nut. (Use a Dremel No. 409 cutting blade.)

When installing the ball links to the block carrier, use an aluminum washer on the front of the nylon block carrier. On the rear, use a taper ream and slightly taper the mounting hole. Place a lock-nut on in such a way that the top goes on first. To accomplish this, you'll need to thread the nut onto a screw to cut traces in the nylon lock-washer in the top of the nut. Then turn the nut over, screw it onto the mounting screw, and tighten it into the reamed area. This technique will eliminate any play between the screw and the mounting hole. When installing the ball links on the fiberglass shock tower, slightly ream out the mounting hole on the front. Next, insert the screw through the ball link, the aluminum washer and the hole in the shock tower, and screw on the lock-nut upside-down. This will eliminate any play between the screw and the mounting hole. When connecting the steering rods, place a tapered brass washer on the bellcrank and on the steering-block mount. Put the steering link in place, and screw on the locking nut upside-down as previously discussed.

Servo-Saver/Bellcrank Assembly

Some problems that all RC 10 owners eventually face is that the aluminum steering-post screws wear, and the stock servo-saver (bellcrank) weakens with time. (See step No. 19.) Both problems cause "wobble" in the steering system.

(Continued on page 102)

RC 10 TECH

(Continued from page 100)

Team Losi* now produces *the* class act in the bellcrank area—its RC 10 Steering Bellcrank with Ball Bearings (No. 7009). To attach the TPS steering system to the Team Losi bellcrank, ream the mounting holes slightly, place the mounting screws on from the bottom and screw on the lock-nuts upside-down (as we did with the Steering Ball Link Modification.) If you choose to use the Team Losi kit, you'll again need to countersink the mounting-screw holes. (We used a ⅜-inch drill bit.) MIP's* Steering-Post Kit (No. 10-1) is an excellent second choice. This kit increases the smoothness of the steering by eliminating both the sharp cutting edges of the screws and the slop that's introduced when the screw threads wear down. Use some of the leftover servo-post mounting screws from step No. 149, instead of the screws provided with the MIP kit. These screws will flush-mount in the stock countersunk holes. Other good alternatives include kits from RC Performance Specialties (No. 310) and Team Pit Stop (No. 6000). (TPS makes an excellent set of stainless-steel replacement screws.) *Caution:* Using O-rings to tighten up the stock servo-saver may cause you to damage your steering servo.

Conclusion

Had enough? Your front suspension is now a work of art and will improve handling as well as lower your lap times because of tighter cornering. These modifications will decrease the car's turning

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RC 10 TECH

(Continued from page 102)

radius by increasing the turning angle of the front wheels. The turning camber angle of the front wheels is also changed so that the wheels bite into the surface by *leaning into* the turn and working against the momentum which pushes the car to the outside. Wide front ends decrease the car's turning radius, but they don't change the camber of the front wheels and therefore do little to overcome the outside push of momentum. You might want to try these modifications on a wide front end. If you do, let us know how it works. Next time, we'll conclude the series with discussions of rear suspension, shocks, battery location, speed controllers, tires and other finishing touches. Till then, good racing!

**Here are the addresses of the companies mentioned in this article:*

Associated Electrics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Team Pit Stop, 15460 S.W. 256 St., Miami, FL 33032.

RC Performance Specialties, 18312 Gifford St., Fountain Valley, CA 92708.

Parma International Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

Team Losi/RPS Distributing, 1655 East Mission Blvd., Pomona, CA 92705.

MIP, 838 Edna Place, Covina, CA 91723. ■

¼ SPRING NATS

(Continued from page 42)

with a disappointing 8.75 E.T.

Tenth-scale Funny Car first-round action started with Dave Irrgang's Mr. Goodwrench Firenza turning a 3.61 E.T. to win over Shawn Hagner's 4.21, and Warren Bader's Miller American car out of Atlantic City, NJ, which tripped the Chrondeks at a 3.45 E.T. on a bye run. Rich Roth's Pennzoil Fine Design F/C won over the Chip & Dale Hobbies car driven by Ed Holloway. (Rich turned a 3.50 E.T., and Ed lost control and went

(Continued on page 123)

1/4 SPRING NATS

(Continued from page 118)

off the track.) In the semis, Warren Bader caught Dave Irrgang napping and went on to win, 3.50/364.37 to 3.62/329.33, and Rich Roth got the bye run. The final round saw Roth clock a quick 3.19 to win over Bader's 3.67.

Only two cars made class call for 1/10-scale Top Fuel, and Tom Aument's Black Magic rail ripped off a 3.19 E.T./408.84mph run to win as Chris Fine's Firefly Digger quit on the starting line.

The hot 1/8-scale nitro-burning funny cars were up next. The marks to beat were Frank Martorelli's low E.T. of 3.93 and Mike Kopchik's sizzling top speed of 82mph, which was turned in on a 4.04 run during qualifying. Prepared to send his Flash on another record run, Martorelli pulled up to the line alongside Dale Carriere's Mad Dog Motors F/C. It was *not* to be: Frank left too early and lit the big red eye, and Dale motored to an easy 7.37 E.T. win. The two M-K Engineering house cars were paired, and Mike Kopchik won with a 6.20 E.T. as his partner, Norton, lost it coming out of the chute, crossed the center line and was disqualified. Ron Mastrocco, with his out-of-the-box car, which was built in only a few days just before the meet, won an easy victory, as his opponent, Dave Griffith's Micro Nitro wouldn't stay lit. Semifinal action featured one of the cleanest, fastest and straightest races of the day, and the Chrondeks had to decide the winner. Dale Carriere's Mad Dog narrowly beat Kopchik in a close 3.97/340.40 to 4.06/348.83 run. Mastrocco got the bye run and went into the finals against Carriere, eventually winning with a 6.65 time because Dale's car broke down.

When the timing lights had been moved from the 1/8-scale quarter out to 330 feet for the 1/4-scale cars, we were ready for the main event. In the Experimental Class, Jim Parker's Bounty Hunter funny car took a first-round win with a 6.29 E.T./209.30mph as his T-Bird opponent barrel-rolled through the lights. Ron Dietz ran against the Camden Tool dragster and won with a 5.49/328.58 to 6.49/157.28. In the final race, the Bounty Hunter trailered Ron Dietz with a good 5.47/248.10 pass against a losing 6.44/211.76 run.

In the 1/4-scale 35cc Funny Car Class, Canadian Terry Howard's Raceworks car was matched against the Eagle One machine and, in a close race, the Eagle won with a 6.67 E.T./169.11mph run against Howard's 6.79/176.12. Chick's

¼ SPRING NATS

Hobbies' Time Tripper won easily, stroking to an 8.40 E.T. as the competition lost fire. In the final, Time Tripper won with a 6.89 E.T./160.14mph run against the Eagle One's faster, but losing, 6.76/145.01 pass. In the 54cc Funny Car Class, a series of crashes eliminated most of the field, but Mike White's Pacesetter took the trophy with a 5.72 E.T./221.67 run.

In the ¼-scale 35cc Dragster Class, it was Jim Parker's Cobra over the Castrol GTX machine (5.43/215.31 to 7.12/140.25), with Parker making a beautiful straight pass. In the 54cc Dragster event, first-round action had the Atco Quarter Pounder rail turn a quick 5.44 E.T./205.44mph to put its opponent on the trailer. In the next race, car 4088 won with a 7.02/175.84 run as the competition, car 4066, was disqualified for crossing the center line. Mike White, with his Vaporizer, drew a bye run and laid down a 5.18/241.92, just to show he meant business. In the semis, the Quarter Pounder had a solo run, and White's honkin' dragster won with another 5.18/242.58, because the opposition suffered mechanical problems.

The final promised to be exciting, with the Quarter Pounder running against the Vaporizer, and both drivers staged very carefully. Mike didn't let his competition worry him, and he won with a consistently fast 5.20/240.64 to the Quarter Pounder's 5.60/197.01 pass. Quarter-scale Top Fuel went easily to George Denault when his only competition, the Night Flight car, didn't make it to the line; George blasted

(Continued on page 126)

1/4 SPRING NATS

(Continued from page 124)

through the quarter at 5.16/227.84.

There was a special 1/4-scale shootout with the winners of all the classes, and this required "dial-ins" by the drivers to arrange the handicap starts. This is pretty tricky, because if you fudge your dial-in and go too fast, you "break out" and lose automatically.

With $400 up for grabs, the drivers really gave it their best shot and prayed for a little luck. The first pair was Mike White, with his Vaporizer against George Denault. In a good close run, Denault got there first, running a 5.26 on a 5.10 dial-in, while White turned a 5.19 on a 5.15 dial-in. The second pair consisted of the Time Tripper against Jim Parker's Cobra, which ran on borrowed parts after Jim's were lost in transit. Parker won with a 5.37 on a 5.33 dial-in, the Tripper cutting a 7.32 on a 6.80 dial-in. In the next race, car 123 won with a 5.51 on a 5.40 dial-in, beating Mike White's Pacesetter F/C, which cranked-off a 5.69 on a 5.70 dial-in.

In the semifinal round, George Denault's consistency didn't help him, and his 5.20 on a 5.15 dial-in lost to the 123 car's 5.46 on a 5.40. Jim Parker drew the bye run, and was practically *given* a win when 123 suffered some damage to the front end in a return-road accident.

Problems with organization and administration are expected at any first-time show like this, but, on the whole, the meet went well and laid the groundwork for some fantastic future shows. I heard that some pretty heavy backing from some big-time people is forthcoming, but I'll save this for their official announcements in the near future!

**Here are the addresses of the companies mentioned in this article:*

Pacesetter Products, 930 W. Hyde Park Blvd., Inglewood, CA 90302.

Sun Racing Products, Tidswell Ave., Medford, NJ 08055.

M-K Engineering (Aeromarine Laminates), 77 Cedar St., Babylon, NY 11702.

Fine Design & Manufacturing, 2 North St., Middletown, NY 10940.

New Era Products, P.O. Box 7338, Nashua, NH 03060.

Inter-Fab Custom Machining, 12 Springdale Rd., Cherry Hill, NJ 08003.

PDI, 16922 N.E. 124th St., Redmond, WA 98052.

Tech Toys, 19 Lancaster, Pinebrook, NJ 07058. ■

SUPER SABRE

(Continued from page 54)

lubrication to all the gears that mesh. Before joining the two halves of the diff housings, I applied a small bead of grease along the edge of the gearbox housings, so ensuring a tight, virtually waterproof join.

When both diff systems have been assembled, it's time to incorporate the suspension systems. Here again, ample lubrication is vital for all moving parts. When attaching the double wishbone arms, you'll need to connect the dog-bone shafts directly from the diff axles to the wheel axles before securing the wishbones to the diff. Pinion-gear placement is an easy task with the included pinion-gear spacing tool; a perfect fit every time!

Next, attach the motor. To prevent improper mesh of the motor mesh and the rear diff gear assemblies, Tamiya provides a kit of set-plates that install on each side of the motor setscrews, thus sandwiching the mounts and eliminating the possibility of misalignment. Shock assembly and installation follow. Two points are important: First, be sure to place the

(Continued on page 130)

SUPER SABRE

(Continued from page 126)

proper amount of shock oil (provided in the kit) into each shock. (You'd be surprised at the difference the wrong amount can make to performance.) Second, don't interchange the front monoshock spring (the largest of the three) with the two rear shock springs, because this would cause a dissymmetry in jumping, landing and cornering capabilities.

The next step in the instructions encompasses attachment of the front and rear diff systems to the main chassis tub. The final steps are the installation of the radio gear, wheel assembly and installation, and body prep. Follow instructions, and you'll have no problems. The body is made of Lexan, and this requires the use of Lexan/polycarbonate-compatible paint compounds, which adhere properly and protect the underside of the body. Tamiya has already done some of the body trimming, so minimal cutting is necessary before paint application.

PERFORMANCE: At the launch pad, I made a final systems check to ensure that the radio gear wasn't picking up any interference and that all servo settings were exact, and then I was off to my local track. To avoid attracting too much

(Continued on page 132)

SUPER SABRE

(Continued from page 130)

attention at the track during prime time, as well as to avoid those ever-popular demolition-derby racers, I made an especially early start. On the starting line, the Super Sabre looked impressive—even fearsome!—its glimmering stainless-steel-silver paint accented beautifully by the red body trim.

I usually go slowly for the first two or three laps to get the feel of the track and to test the car's maneuverability. The Sabre handled the track well, so it was time for some *real* racing. As I rolled up to the starting line, I noticed the arrival of some expensive competition—a 4WD rig. What better way to test the Sabre than challenge the driver to a race? When we were given the signal to go, the Super Sabre's tires tossed dirt as it sped away. I was impressed with the car's rapid acceleration, and the Sabre dominated the race until the first sharp turn. Then things started to happen in quick succession: The front wheels began to chatter and lose traction, and the car spun out while my adversary flew by. Feeling somewhat dejected, I rolled the car into the pits.

Why did the car lose control so easily in the first turn? During a close examination, I realized that I'd neglected to snap the ball ends of the front anti-roll bar to the upper wishbone arms. After two quick snaps, I was back on the course to face my gloating competitor. We were off! The Sabre's top end was much faster than that of the other car, but the real test was to come—turn No. 1! With the anti-roll apparatus functioning properly, the

(Continued on page 135)

SUPER SABRE

(Continued from page 132)

Sabre ate the turns with no sign of rolling or sliding. With its excellent center of gravity and tightly tuned suspension system, we approached the first set of jumps together. Here's where the Sabre encountered the first test of its durability. Just after performing a series of jumps, the Sabre was rear-ended between its rear wheels and flipped over several times. The car was undamaged, but this incident reinforced my only criticism of the kit: The rear bumper simply can't protect the rear suspension, tires or diff housing against impact and possible damage during hard-core competition, and it should be replaced with a larger one. When I'd wiped the sweat off my brow, it was back to serious racing. The best way to describe the outcome of our fun day of competition is to say that the Sabre did a respectable job of keeping up with the expensive rig, although this comparison isn't really fair as the other car costs almost twice as much. The Sabre, however, will do some serious cutting through the pack in Production Class. By the way; my competitor now has a Super Sabre!

As your flashing Sabre cuts through the competition and carves up the course, *you* can be the titan of the track!

**Here are the addresses of the companies mentioned in this article:*

MRC/Tamiya, 2500 Woodbridge Ave., Edison, NJ 08817.

Futaba Industries, 555 W. Victoria St., Compton, CA 90220. ■

INDY 500

(Continued from page 30)

The early 500-mile machines were all front engine with an extra seat for a mechanic. The engines were anywhere from 183-cubic-inch 4-cylinders to 589-cubic-inch 6-cylinders. Duesenberg, Peugeot, Mercedes and Fiat were some of the machines that finished high on the totem pole, but none was able to dominate by winning a number of consecutive victories. The 1919 500 brought some new machines to the racing world, i.e., the 8-cylinder Ballot and the 12-cylinder, 299-cubic-inch engines. The 1920 500 was won by Gaston Chevrolet in a 4-cylinder, but seven of the other nine who completed the full 200 laps were powered by 181-cubic-inch 8-cylinder engines.

For the next 20 years, the eight

(Continued on page 138)

INDY 500

(Continued from page 136)

cylinder, though it occasionally traded victories with the four and six bangers, was the engine to run. Its displacement hovered around 180 cubes until 1923, when the top finishers came in with 120 cubic inches. Then, in 1926, the engine displacements dropped to a mere 90 cubic inches—a little larger than some of today's big motorcycles. In 1929 (the last year Indy saw the 90-cube engine), Cliff Woodbury posted the fast qualifying speed of 120.559, although he only completed three laps. The following year brought a 16-cylinder Sampson Special driven by Louis Meyer. The Sampson Special finished a disappointing 4th, over 16 minutes behind the winning car. The 16-cylinder engine again showed up in the top 10 in the 1932, the 1933 and (the last time) the 1940 500—once again, in the Sampson Special driven by Bob Swanson.

Although the Sampson Special had its share of success, it was never able to bring home the checkered flag, so the concept was scrapped in favor of newer technology. It was at about this time that the designers scrapped the passenger seat to reduce weight, because the cars had become reliable enough to dispense with their riding mechanics. With the approach of the '50s, engines had more cubic inches and fewer cylinders.

By 1949, all of the top 10 finishers in the 500 were running four bangers, and this continued through 1964 with A.J. Foyt's second victory in the Sheraton-Thomson Special. The following year, 1965, marked the end of the front-engine race car when Jim Clark won the 500 driving a Ford V-8-powered Lotus.

The first rear-engine machine to enter the 500 was the Tucker Torpedo Special, way back in 1946. The Torpedo's poor performance convinced designers that this wasn't a winning combination, but, unknown to them, this was the foundation of the fastest machines ever to cross the Brick Yard. The V-8 rear-engine machine was here to stay, and the front-engine cars were never to see the winners' circle at the Indy 500 again.

As average speeds began to approach 150mph, the cars shed the tall narrow tires that had once been so effective, in favor of wider, low-profile tires that could handle the tremendous lateral acceleration. In an effort to cheat the wind, the cars sank closer to the ground with slimmer, sleeker bodies.

Another breakthrough in design came

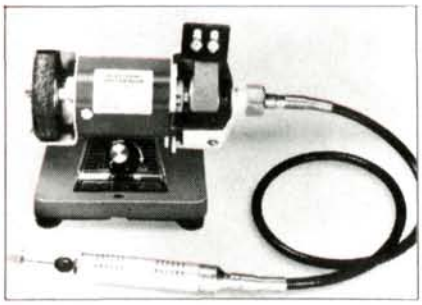
(Continued on page 142)

What's New

SUPER MATCHED SANYOS

Parma's new "Super Matched" Sanyos are the ultimate power source for your R/C electric car, and are available in 4-, 6- and 7-cell packages of individual cells.

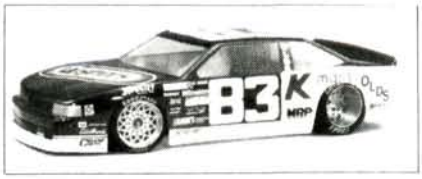
For more information, contact Parma International, 13927 Progress Pkwy., North Royalton, OH 44133.



VIGOR MULTI GRINDER

The Vigor Multi Grinder is the tool that does it all. This versatile multi-purpose machine can be used as a carver, grinder, sander, smoother, polisher, cutter, buffer and more. It has a compact, powerful, 36-inch-long flexible shaft and a hand-piece that fits your hand comfortably. The hand-piece accepts a large variety of accessories with 3/32-inch or 1/8-inch shafts available from Vigor. The Multi Grinder's high speeds (variable up to 10,000rpm) allow it to do many jobs that low-speed tools can't do.

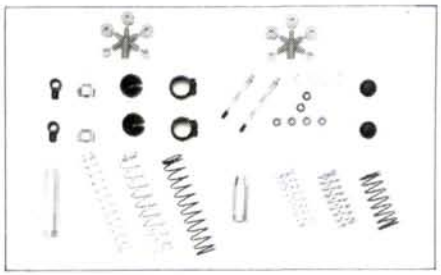
For more information, contact Vigor Co., 53 West 23rd St., New York, NY 10010.



MODEL RACING PRODUCTS '88 OLDS NASCAR

MRP has added the 1988 Olds Cutlass to its growing line of 1/10-scale stock-car bodies. On both the full-size car and this 1/10-scale version, the Olds features a small frontal area and low drag co-efficient for less wind resistance and better speed and handling. The Olds body will fit the wheelbase and track width of any on-road 1/10-scale car.

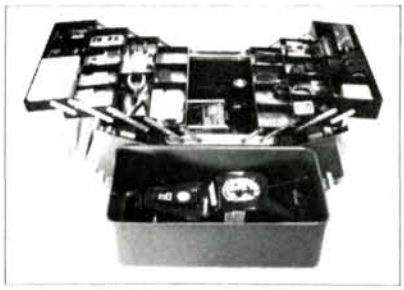
For more information, contact Model Racing Products, 18676 142 Ave. NE, Woodinville, WA 98072.



KYOSHO SHOCK PARTS

In response to overwhelming demand from racers, Kyosho is now offering a complete line of replacement parts for all of its Option House Shocks (both Platinum and Gold Series). Now you can get pistons, O-rings, springs, or any other part you need to keep your shocks working well.

For more information, contact Great Planes, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.



TAURUS ENTERPRISES STAK-PAK

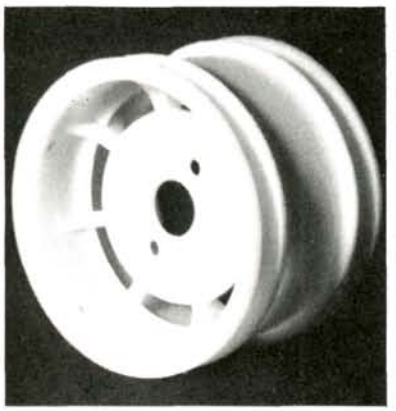
The Stak-Pak is an incredibly light-weight case designed to carry and organize all of your 1/10- or 1/12-scale R/C equipment and supplies. Cantilever trays have movable dividers to tailor the Stak-Pak to your needs, and there's a handy, removable bottom compartment to hold your car. Durable vacuum-formed ABS plastic construction and aluminum hardware ensure rust-free service for years of rugged use.

For more information, contact Taurus Enterprises of Minnesota, 5710 150 St. S.E., Prior Lake, MN 55372.

HOT TRICK CASTER BLOCKS

For those of you who went home disappointed from the races because of a broken caster block on your Yokomo, Hot Trick has just introduced the Yokomo Aluminum Caster Blocks. These have been designed as direct replacements for the original equipment and they're virtually unbreakable.

For more information, contact Hot Trick Racing Cars., Inc., 1157 Cushman Ave., San Diego, CA 92110.

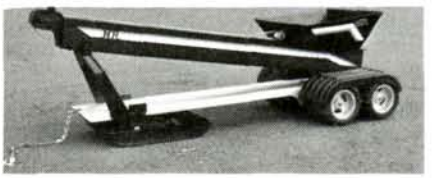


PRO-LINE LIGHTWEIGHT WHEELS

The new Pro-Line racing wheels are feather light, true precision wheels designed for maximum performance.

They're molded of premium-grade nylon co-polymer to give maximum strength and resilience. These wheels meet all IFMAR standards. These and other Pro-Line wheels are made from white nylon and come with dyeing instructions so that you can match your paint job. They're available for most popular cars.

For more information, contact Pro-Line, P.O. Box 456, Beaumont, CA 92223.



ARISTO-CRAFT/POLK DRAGGIN' WAGON

So you think your R/C truck is tough? Aristo-Craft/Polk's Model Craft Hobbies dares you to play tug of war with the Draggin' Wagon. All the excitement of real arena truck-pulling competitions in 1/10-scale R/C! The Draggin' Wagon increases drag with every inch, until only the best drivers can haul it through the mud! You choose how much weight to pile into the Draggin' Wagon's load bucket! Made of tough aluminum and polycarbonate plastic, it's fully assembled and compatible with all 1/10-scale R/C vehicles—*if* they have the muscle to handle it!

For more information, contact Aristo-Craft/Polk's Model Craft Hobbies, 346 Bergen Ave., Jersey City, NJ 07304.

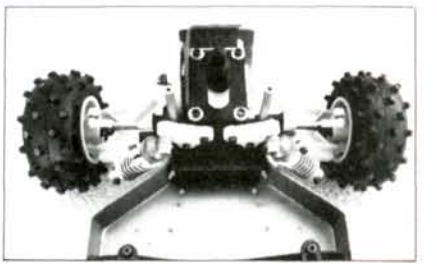
J&E ENGINEERING NORTHEAST MODIFIED

Reduced by computer from a full-size modified, and aerodynamically tested, the J&E Engineering Northeast Modified is typical of the short-track modified stock cars found racing in the Northeast. It brings the full-scale look to the 1/10-scale short-track racer and is available in clear, impact-resistant plastic.

For more information, contact J&E Engineering, 139 Main St., Warrensburg, NY 12885.

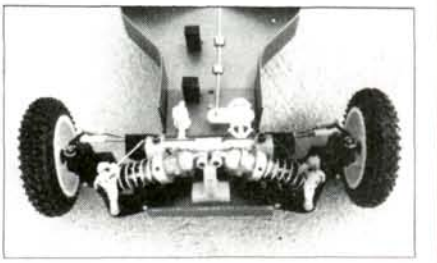
PARMA CUSTOM BODY

Tired of painting bodies? Parma's new custom-painted Shark body is now available in a rainbow of color schemes. Just mount it and go! Will fit most 1/10-scale bodies by using a Parma body-mounting kit.



McALLISTER RACING LOWERING KIT

The McAllister Racing Oval Lowering Kit for the RC 10 solves the problems of fitting stock-car or on-road racing bodies to the RC 10. The kit lowers the front and rear ride height and the center of gravity by bringing the shocks lower to the ground.



For more information, contact McAllister Racing, 2205 First St. Unit 107, Simi Valley, CA 93065.

INDY 500

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in 1972 when the cars sprouted front and rear wings to provide additional downforce. The new battle wasn't for speed, but was to keep the cars stuck to the ground in the corners. Mark Donahue's victory in the '72 Indy 500 started yet another new era in design as the wingless machines faded away. A McLaren, Lola or March was soon the chassis to have if you wanted to win the 500 of 500s. Right up to the present, March and Lola have traded victories, and Penske and others have kept them on their toes with occasional wins.

The British-made racers have gained a strong foothold with the Cosworth engines, and the Marches and Lolas still ran successfully in this, the 72nd, Indy 500. One major setback to the British invasion during this year's race was the development of the Penske PC-17 combined with the new Chevy engine. Driven by Rick Mears, Danny Sullivan and Al Unser Sr., during the qualifying, the three Penske cars made one of the most impressive showings that the 500 has ever seen. By turning in the fastest qualifying times, all of Penske's entries in the Indy 500 occupied the front row, with Mears on the pole. Hence, yet another chapter in the tale of the ultimate racing machine is written, with no one able to write the final page by conquering the world's oldest operating speedway.

Even the best machinery money can buy needs one key element to sweep the Brick Yard with any consistency: the most talented drivers, who come from all over the world. It takes a special driver to keep the pace at Indy. Very few are ever blessed with the chance for a ride there, and for those who are, it's a long, hard road to victory.

Indy drivers have come and gone, but the few who endure and thread their way to the checkered flag have earned their places in racing history. No one has won more than four times. One prominent racing figure at Indy is A.J. Foyt, who won in 1961, 1964, 1967 and 1977. This driver also holds another record—one which is unlikely to be beaten for quite some time. With the 72nd Indy 500, A.J. Foyt has qualified and raced in 31 consecutive Indy 500s. The only other driver to match Foyt's record of four wins is Al Unser Sr. who won in 1970, 1971, and 1978 and last year in 1987. Until this year's race, Johnny Rutherford was alone with three victories (1974, 1976 and 1980). This year's race brought Rick Mears to the elite club of three-time

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INDY 500

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winners. His first victory came in 1979, the next in 1984, and this year's win brings him to three. Mears also gets the best "batting-average award" for winning more than one in four starts at Indy with his third victory in 11 starts.

Another interesting story is that of Mario Andretti. Andretti is one of the most successful drivers on the CART and Formula 1 circuits, having brought home more prize money for laps led (over $150,000) at the Indy 500 than any other driver. He's also in the top ten for actual laps led at the raceway, but his only Indy victory came in 1969, and, since then, a second run at the checkered flag has eluded him. He's had a series of mechanical failures, crashes and just bad days at the races. This is further proof that the Indianapolis Motor Speedway belongs to no one—unless you count the Hulmans, who own the track!

This year's Indy 500 proved to be no less exciting than the previous 71, with a gathering of the fastest drivers and machines ever to assemble there. With the whole Penske team occupying the front row and Mears with a qualifying speed almost 3mph faster than Danny Sullivan in 2nd, all eyes were on the pole-sitter in the new Penske ride. As Chuck Yeager, driving the Olds pace car, floated down to the apron coming around turn 4 and the green flag was hung to the wind, the hammers hit the floorboards and Danny Sullivan nosed out Mears in turn 1 for an early lead.

Right on the tail of the leaders, Unser came from the outside of the first row, ducking in behind Mears for 3rd place. As the pack began to thin out amidst a series of crashes and yellow flags, the front runners tightened their belts and aimed their sights on the checkered flag. Sullivan was keeping an exhausting pace at the head of the pack, while Mears, who was experiencing some minor mechanical problems, fell off the pace. This allowed Sullivan to stretch out his lead and Unser Sr. to take over 2nd place. At the nadir of his downward spiral, Mears had dropped back to 9th place, but with all the yellow flags (11 in all, as the result of the numerous accidents), Mears' pit crew was able to adjust the car and get it back on the winning pace. At just past the mid point of the race, Danny Sullivan was one of the 11 to leave the race because of an accident, thus allowing Unser Sr. to move into the lead and hold on for what he hoped would be his record fifth victory

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INDY 500

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at the 500. With Mears' car back up to pace, covering the oval at speeds faster than the lead car, he began to weave his way through the pack in an attempt to catch teammate Unser Sr. Toward the end of the race, Mears caught Unser and rode his tail feathers as he waited for the mistake that would allow him to pass. Mears finally had a chance to pass when Unser hit an unsuspecting rabbit crossing the track. This didn't necessarily slow Unser down, but word has it that Mears caught the rabbit's foot as he followed Unser through the turn, and shortly thereafter he passed Unser for the last time on his way to the checkered flag. With the number of complete laps closing on the 200 mark, Unser's chance for a 2nd-place finish was in the balance. Emerson Fittipaldi, driving the Marlboro Racing March, was challenging for the second spot. Fittipaldi, like Mears, passed Unser Sr. for the second spot and held on as the race dwindled to only a few remaining laps.

An unusual situation arose shortly after, and it almost cost Fittipaldi his hold on 2nd place. Andretti, driving the blue-and-yellow Kraco March, lost his side pod in the middle of the track, and this brought out another yellow flag. Under the rules, a driver is not allowed to change his position by passing cars in front of him. Emerson Fittipladi, as seen by the eyes of the officials, passed Rich Vogler under the yellow and was subsequently penalized a lap. This cost him 2nd place and moved Unser and Andretti up a slot. What the race officials didn't know was that Vogler's car was damaged in a previous accident and couldn't keep up the pace. Vogler waved Fittipaldi past as he went down to the inside of the track to get out of his way. When Vogler told the officials of the actual circumstances, the decision was reversed and Fittipaldi was again in 2nd place.

As was anticipated, the race finished under the yellow, with Mears bringing home his third victory in 11 starts, Fittipaldi 2nd and Unser Sr. settling for a disappointing 3rd.

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INDY 500

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And so another year passes at the Indy 500. As always, it was a spectacular show of endurance and courage that kept the spectators on the edge of their seats. For those of you who've never been there, if you're a racing enthusiast, attending this race is something that ranks as a "must do." Open-wheel racing is one of the most exciting facets of automobile racing, and the Indianapolis Motor Speedway brings it to you with a tradition of excellence that is unparalled by any other event in the history of racing! And as long as there's an interest in racing, and race cars still have tires running on asphalt, the Indy 500 will be the world's premier motorsport event. ■

CAT XLS

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When the belts are in place over the top layshaft (which also has its own diff to allow free operation of the rear diff) and the rear diff pulleys, the left-side aluminum plate is installed, followed by the upper and lower fiberglass chassis plates.

I can see two minor problems with the rear diff: First, the three pulleys on which the drive belts ride have no guides for the belts, and this allows the short outer belts to ride over to the side of the pulleys and rub the aluminum plates. While the plates are sufficiently close to the diff to keep them from coming off, it will cause some friction, and this may reduce run time.

Second, the eccentric belt tensioners are held in place with self-tapping screws. This isn't a big problem, but taking into account the required maintenance, constantly removing these screws may cause them to strip. A simple solution is to tap the mounting holes with a 2-56 tap and use short 2-56 Allen-head machine screws. The assembly of the front diff is similar to that of the rear diff, so this should pose no real problem.

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CAT XLS

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When the front diff has been assembled and allowed to dry, the front transmission housings are installed, followed by the one-way bearing drive shafts. When this is complete, the front diff assembly is attached to the chassis with mounting brackets. These mounting brackets allow the front diff to slide back and forth for belt-tension adjustment. At this point, there's no need to adjust the belt tension, because these screws must be removed to install the Lexan belt cover later in the assembly process.

The next step is to adjust the tension of the shorter rear belts. The instruction manual gives you an idea of how tight these belts should be, but the correct tension adjustment will have to be determined when the car is running. When this is completed, the diff cover is installed, and this is followed by the installation of the rear suspension brackets. In step 14 of the instruction manual, during the installation of the rear suspension brackets on which the upper arms will pivot, an M3 x 55 stud is called for. This passes through the transmission housing to act as a mount for these suspension brackets. After searching for a while to find the elusive stud, I found it packaged with the steering and suspension linkage rods. It's similar to the linkage rods, with threads only at the end. Passing the rod through the transmission housing is a rather tight fit, but, with the help of a few light taps with a small hammer (be careful not to damage the threads), it went in easily.

Next in the assembly sequence is the installation of the suspension arms. This went smoothly apart from one minor glitch. The front pivot for the rear lower arm on the right side of the car will interfere with the spur gear. This is cured by simply filing or shaving off the obstructive portion of the mount. The rest of the suspension arms go into place as described in the instructions.

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CAT XLS

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A unique feature of the front suspension on the Cat is the way the arms pivot horizontally to allow the assembly to kick back and so prevent damage during a collision. A rubber band (simple though it may sound, it's very effective) is wrapped between two lugs in the front of the suspension assembly. When hard contact is made, the rubber band will allow the suspension assembly to pivot backwards and absorb the impact. It then returns undamaged, to its usual position. Wrap the rubber band as tightly as possible; this allows adequate protection, but it won't allow the suspension to pivot, and so cause erratic handling, during normal operation.

Installation of the front anti-sway bar was bypassed, because it not only requires that the Lexan belt cover be cut to allow the sway bar to pass beneath it, but the sway bar also has to pass under the belt with very little clearance.

Next, the wheel hubs are attached to the suspension arms, and this is followed by the installation of the shocks. The shocks are made of high-quality aluminum and are worthy of the Cat, but I made one change to make the dampening more consistent. After filling the shocks with CRP 40-weight shock oil (the kit doesn't include any shock oil), I replaced the O-ring seal (designed to seal the shock when the cap is screwed on) with a CRP* Shock Pressure Gasket. These diaphragm-shaped gaskets compress upward as, while under compression, the oil displaced by the shock piston fills the chamber of the shock. By keeping air out of the shock, it eliminates the possibility of the oil foaming. (Foaming would alter the dampening properties of the shock.)

From here on, the only thing standing between the Cat and the track is the installation of the electronics. Wisely, the Cat doesn't include electrical components such as a speed control or motor. Most racers have a personal preference, so they'd substitute alternatives, and including electronics in the kit would result in a higher retail price. I used a Futaba* Magnum radio with an FP-S135S high-speed mini servo. The Cat is designed to accommodate a larger servo, so to fit the smaller servo, I had to drill new mounting holes in the chassis and chassis pan. The unassembled servo-saver was scrapped in favor of a race-proven Kimbrough* servo-saver. For power, I chose a Trinity* No. 2004 4WD

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CAT XLS

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motor. When combined with the new Novak* NESC-1X speed control, it provided the best low-end punch and top-end speed I've seen.

Attached to the Trinity motor was a 19-tooth 48-pitch pinion gear driving a 90-tooth 48-pitch spur gear from Robinson Racing Products*. These gears are machined instead of molded to ensure the most exacting tolerances. The 90-tooth spur gear is identical in size to the stock spur, but it's 48-pitch and the stock one is 32-pitch. Robinson offers a complete line of these precision-machined spur-and-pinion gears for the Cat and many other cars, and I recommend them.

The final assembly steps entail painting and installing the Lexan body and other miscellaneous trim pieces. Among the body, chassis pan and wing pieces, there was a Lexan motor cover, a gear cover and drive-shaft guards that I left on the Lexan scrap heap. Covering the motor is a ridiculous idea; I see no need to protect the rear drive shafts from dirt; and if the motor cover fit, it would hinder all efforts to make those frequently-needed last-minute adjustments before racing.

You may have noticed the body; this is *serious* paint work., Although I think the job is nothing short of awesome, I confess that it's *not* my work, but the work of Richard Muise of Motion Graphics*. Richard makes it his business to paint the finest bodies money can buy, and they *do* take some money to buy. With bodies in the $60 to $150 price range, you might not want one on a car that gets a daily thrashing. But if having the sharpest-looking car around ranks high on your list of priorities, Motion Graphics is the place to go.

PERFORMANCE: Before testing the

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CAT XLS

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Cat at the track, I made a number of adjustments to ensure optimum performance. The standard adjustments like steering center, speed-control fine-tuning and shock-spring spacing are in order, as is adjusting the elaborate drive system. The first adjustment should be the rear differential, and this is done by holding the adjustment screw with a flat-head screwdriver and turning the left-hand wheel. Keep tightening the diff until, with a fresh battery in the car, there's a slight slip with a strain on the motor. To prevent it from slipping, make sure that the adjuster nut on the spur gear is tight. With only the front end on the ground, repeat the same adjustment process for the front diff. When you think you have your adjustment in the ballpark, take the car to the track to fine-tune the handling.

Complications encountered during assembly all seemed insignificant when the Cat first purred to life. Its first track run was in a 4WD Modified Class qualifying heat at the BORRA racetrack in Bethel, CT. The Cat was at the rear of the starting grid, and, in most cases, this isn't a good place to start. No problem for the Cat! At the sound of the starting gun, a unified field left the grid, but by the middle of the front straight, the Cat had shot through to a commanding three- to four-car lead. Going into the turns, the Cat is extremely maneuverable, without the "push" inherent in most 4WD cars. It seems that the new front diff and one-way drive shafts were great in helping the Cat turn the corners. With the Trinity/Novak combination, coming *out* of the corners was also a new experience. Unless caution was exercised in applying throttle, the front end would lift off the ground as a result of the intense surge of power. Getting airborne wasn't too difficult either, as the Cat flew relatively well once the spring tension had been dialed.

The only major design flaw is in the differential system. Because there are three separate pulleys for the rear diff, when cornering or accelerating, the different belts may rotate at different speeds. Because the pulleys on the diff occasionally travel at different speeds, the layshaft that drives the differential must also allow the two belts to travel at different speeds, hence another differential. A differential is also necessary on the spur gear for the same reason one is used on the layshaft, so you now have three. The long center belt that leads to the front end is also connected to a diff, and this brings the count to four. Finally, the one-way shafts up front bring the count to five. The drawback of this system is that the front differential, regardless of how tight it may be, is only as strong as the setting on the rear differential. In many cases, when racing a 4WD car, it's preferable to bias a little extra power to the front wheels to allow the car to pull through a turn and increase stability on the straights. With the existing differential, biasing the power to the front is a losing proposition that could hold back the dynamic performer.

I also question the use of the dust-seal bearings in the Cat. These bearings are very precise and I'm sure that the seals will keep most, if not all, of the wear-causing debris from entering the bearing. But the dust seals ride directly on the inner race of the bearings, and this causes drag. When you multiply that amount of drag by the number of bearings in the kit, it's clearly a lot of unnecessary friction that could be eliminated by using a standard precision bearing. They may require more maintenance and regular cleaning, but if the result is faster speeds and longer run times, then I'll sweat it out.

If I sound critical, it's because this car is among the elite—the best of R/C cars—and it warrants a discriminating opinion. Looking at the whole picture, there are only a couple of cars that can consistently challenge the Cat. This car isn't made to run for 15 minutes on an unmatched pack, nor is it able to rebound from a 10-storey fall without a scratch. It's designed to run for four hair-raising minutes, and that's just what it does. The problems I point out won't hinder the performance of the car; rather, they're areas for improvement to make the Cat even faster. As proved by Masami Hirosaka during the World Championships, in capable hands, right out of the box, the Cat is able to compete with the best racing machines in the world, and the new XLS version of the Cat shows Schumacher's commitment to keeping this car competitive.

**Here are the addresses of the companies mentioned in this article:*

Schumacher; distributed by TRC, P.O. Box 478, Oakboro, NC 28129, and Trinity, 1901 E. Linden Ave. #20, Linden, NJ 07036.

Parma International, Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

CRP, 3250 El Camino Real B-3, Atascadero, CA 93422.

Futaba Industries, 555 W. Victoria St., Compton, CA 90220.

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CAT XLS

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Kimbrough Products, 1430 East St., Andrews Place/Unit E, Santa Ana, CA 92705.

Trinity, 1901 E. Linden Ave. #20, Linden, NJ 07036.

Novak Electronics, Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

Robinson Racing Products, 501 Peach, Santa Ana, CA 92704.

Motion Graphics, 1161 Old Taneytown Pike, Westminster, MD 21157. ■

TRACK DIRECTORY

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Jeff Williams

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1400D Westgate Pkwy., Dothan, 36303
(205) 793-2439

WEBSTER'S CHAPEL RACING TRACK
Old Webster's Chapel School, Alabama 36265
Robin Byrom (205) 435-5576

ALASKA

ALASKA R/C OFF-ROAD RACERS
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(907) 278-4250 Bob Peter, (907) 345-3269

ARIZONA

ESCALANTE RACEWAY
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(602) 298-1253

SAGUARO WEST RACEWAY
West Plaza Shopping Center, Phoenix
(602) 465-9614

SCALE RACING SPORTS
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(602) 829-9117

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ANTIOCH R/C RACEWAY
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Jack Hanson (415) 754-5700

ELECTRIC OFF-ROAD RACEWAY
1801 Springs Rd., Vallejo, 94590 (707) 557-0302

HOBBY BENCH RACEWAY
515 S. Glendora Ave., Glendora, 91740
(818) 963-9517

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TRACK DIRECTORY

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ORRCA CENTRAL DIVISION
3188 N. Marks, #121, Fresno, 93711
(209) 233-3665 or (209) 229-9366

ORRCA
P.O. Box 8938, Calabasas, 91302
Lou Peralta (818) 340-5750

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1261 Lick Ave., San Jose, 95110
Peter Liu (408) 279-0111

RADIO CONTROL RACE CENTER
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Cliff & Rhea Fisher (213) 324-3105

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(714) 623-1506

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SROKA'S INDOOR R/C SPEEDWAY
5216 B Arboga Rd., Marysville, 95901
(Not a mailing address)

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TRACK DIRECTORY

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COLORADO

MHOR R/C RACEWAY
15540 E. Batavia Dr., Aurora, 80011
Jess Brockman (303) 343-0151

R/C DIRT WORLD/AA HOBBIES
1801 South College, Fort Collins, 80521
(303) 493-7199

QUEEN CITY R/C RACEWAY
5050 S. Federal Blvd., Englewood, 80150
(303) 730-1391

R/C WORLD & TRACK
2424 Wes Evans, Denver, 80219
Glen Orcutt (303) 935-0842

CONNECTICUT

BETHEL R/C OFF-ROAD RACING ASSOC.
Bethel, CT, (203) 794-0163

ELECTRIC AUTO RACING TEAM OF HARTFORD
"Buckley Speedway"
37 Douglas St., Hartford, 06114
Ziggy or Debbie (203) 246-4778

CT R/C OFF-ROADERS
Oldfield School, Mona Ter., Fairfield, 06430
Don Hanson (203) 336-9624

In keeping with our constant efforts to help foster the growth of the radio-control car hobby, we've decided to run this track directory intermittently to inform modelers where they can race and exchange ideas. If you'd like your track listed, send us your name, address, phone number and some information about the track to **R/C Car Action Track Directory**, 251 Danbury Road, Wilton, CT 06897. We'll list as many clubs as space allows.

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